

Vol. 1. Part 8

FEBRUARY, 1921

Number 8

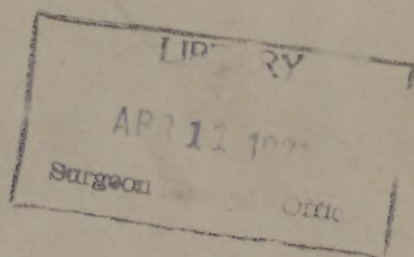
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BULLETIN

OF THE

New
NATIONAL RESEARCH
COUNCIL

INTELLECTUAL AND EDUCATIONAL STATUS OF THE
MEDICAL PROFESSION AS REPRESENTED
IN THE UNITED STATES ARMY

BY MARGARET V. COBB AND ROBERT M. YERKES



PUBLISHED BY THE NATIONAL RESEARCH COUNCIL
OF
THE NATIONAL ACADEMY OF SCIENCES
WASHINGTON, D. C.
1921

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SUMMARY

I. Records

Records for approximately 2500 medical officers constitute the material for the statistical investigation herein reported.

II. Concerning Medical Officers

1. *Intelligence.*—The intelligence rating of medical officers is lower than that of other arms of the service with the exception of the Dental and Veterinary Corps. It is practically the same as that of the Quartermaster Corps.

When the results of intelligence examination are considered by tests instead of for the total examination, it appears that the scores differ widely for the several arms of the service. The psychograph (curve representing measurements for eight types of test which constitute army group-examination) for medical officers differs strikingly from that for artillery officers or that for engineers. This is still true of the medical group when it is broken into specialties. The psychographs of the several special medical groups have a very obvious family resemblance.

These differences in the relative degree of development or strength of intellectual functions for the professions of medicine and engineering may prove to have vocational or educational values, or both. The importance of further research is clearly indicated.

2. *Factors affecting the intelligence status of medical officers.*—Chief among the factors whose responsibility for the relatively low standing of medical officers has been suggested are: Age, habits of deliberateness and accuracy developed by professional training and experience, characteristics of the tests which render them easier for engineers than for medical officers, and method of military selection.

It has been shown by statistical analysis that age is significant. The military data indicate that median score of medical officers for army intelligence examination *a* diminishes from 277 points at 25 years to 258 at 30 years, 255 at 40 years and 223 at 50 years. Since about half of the group of medical officers in question are over 35 years of age, and 35% are above 40 years, and since also the average age of officers of other arms of the service is from 6 to 8 years less than that of medical officers, it is obvious that the relatively low intelligence rating of the medical group is partly

due to more advanced age. The form of the psychograph also changes with age.

Neither professional training and experience nor the characteristics of the tests importantly influence, so far as analysis indicates, the intellectual rating of the medical group.

Method of selection, on the other hand, appears to be responsible to at least as great an extent as is age for the unsatisfactory intelligence of medical officers. Whereas, for most other arms of the service candidates for commission were sent to officers' training schools and there subjected to rigorous training and systematic examinations which tended to eliminate the intellectually incompetent, appointments to the Medical Corps, because of the imperative need for large numbers of medical officers, were made directly on the basis of age, certification by the American Medical Association, experience (and sometimes professional examination), prior to enrollment in the medical officers' training camp. This difference in procedure undoubtedly worked to the disadvantage of the Medical Department, so far as the intelligence of its officers is concerned. In the Medical Corps experience and professional reputation counted heavily. In the other arms of the service military educability and adaptability under the eye of instructors with whom rested the power of recommendation counted most of all.

Given identical age groups and similar methods of military selection, it seems probable that the intellectual status of the Medical Corps would differ little from that of the Engineers or Artillery. The psychographs for these groups might, however, differ extremely, thus indicating either primary differences in intellectual constitution or differences induced by professional training and experience.

3. *Education.*—The typical medical officer is a high school graduate with about four years' professional training. He has devoted more of his life to schooling than has the officer of any other arm of the service. His median length of schooling is 15.8 years, whereas that of the Engineer is 15.3 and of the Quartermaster 12.4.

4. *Experience.*—In general the medical officer is more experienced than any other type of officer. The medical group studied reported 11.07 years of experience. This fact gives point to the statement made above that experience was an important consideration in the appointment of medical as contrasted with other officers.

5. *Geographical relations.*—When classified by section of the country from which they were graduated or certified, or in which they practiced, these medical officers exhibit substantial differences in intelligence, earnings and experience. Generally speaking, the northeast, the central and the northwest sections of the country show superiority over the south and south central sections.

Intelligence and earnings vary also with the population of the community in which the medical officer (as civilian, of course) practices. The order of increasing values for intelligence is rural, urban, metropolitan; that for earnings, rural, metropolitan, urban.

6. *Earnings.*—The annual earnings reported by these medical men vary signally with geographical location, population of community, professional specialty, experience and medical school. The correlation between intelligence and earnings is extremely low.

7. *Military relations.*—Medical officers of the Regular Army Medical Corps and of the National Guard achieved somewhat higher intelligence ratings than those of the Medical Reserve Corps.

Intelligence is highly correlated with rank in the Medical Corps. This indicates, to the credit of the Medical Department, that superior intelligence tends to dominate in the rank of major and above. Promotion also depends to a significant degree on intellectual capacity, as is indicated by the intelligence ratings of promoted versus non-promoted officers.

The data of this report justify the statement that the Medical Corps obtained the services of the ablest as well as the weakest men of the profession. Had the latter been eliminated by a rigorous procedure of intelligence tests, combined with professional examination, the status of the group would undoubtedly have compared favorably with that of any other professional group in the army.

8. *Membership in societies.*—The typical medical officer of this group claims membership in two or three medical societies, one of which is usually the American Medical Association.

III. Concerning Medical Schools

1. *Classification.*—More than 130 medical schools are represented by the 2507 medical officers statistically considered. The numbers from these schools vary from 1 to 118. Grouping of the schools for statistical purposes was necessitated by the small number of individuals from most institutions. Five classifications have been made: By geographical location, by size (number of stu-

dents registered in 1916-1917), by entrance requirements, by American Medical Association rating, and by medical sect.

2. *Geographical classification.*—The intelligence ratings and earnings of graduates from schools in different sections of the country correspond in general to the same information for the medical men resident in those sections.

3. *Classification by size.*—The schools represented in the medical group were separated according to size into 8 divisions ranging from those having less than 50 students in 1916-1917 to those having 400 or more. The men graduated from the larger institutions make, on the whole, a somewhat higher intelligence rating on examination alpha than those graduated from the smaller. Earnings, on the other hand, are not closely correlated with the size of the school.

4. *Classification by entrance requirements.*—This classification was made on the basis of requirements enforced in 1916-1917. The intelligence of the medical officer is highly correlated with the standard of entrance requirements of the school from which he was graduated. The median score, in army examination alpha, of graduates from schools requiring but one year of college work in addition to high school graduation is 118.7, whereas that of graduates from schools requiring more than 3 years of college work is 154.2, a difference of 35.5 points. The earnings reported by men from schools with high entrance requirements are also strikingly larger than those from schools with low entrance requirements.

5. *Classification according to rating of the American Medical Association.*—The difference in median alpha scores, between graduates of schools rated "A" by the American Medical Association and those rated "C," is 17.3 points, which, though significant, is less than half as great as the difference between schools of the highest and lowest entrance requirements. The difference in earnings between classes "A" and "C" is comparatively small.

6. *Classification by medical sect.*—In both intelligence scores and earnings the graduates from homeopathic schools stand as much above the eclectic schools as the class "A" schools are above the class "C" schools. Graduates from "regular" schools fall approximately half way between the other two.

7. *Comparison of schools.*—A detailed comparison (table 43) of the graduates of the 18 schools which were represented in the medical group by more than 35 students each shows that the

median intelligence rating is A for seven schools. Median earnings of \$5000 or over are reported by the graduates of eight schools. The southern schools on the whole show lower scores, less schooling, lower earnings and fewer promotions than the northern.

HISTORICAL STATEMENT

The psychological examination of officers in the United States Army very promptly indicated that the intellectual status of medical officers was less satisfactory than that of officers of several other arms of the military service. Colonel Henry A. Shaw, of the Regular Army Medical Corps, invited the attention of the Surgeon General to this fact in a report, submitted November 16, 1917, which he based upon observation of the psychological service and data of examination at Camp Lee, Virginia.¹

Table 1, quoted from Colonel Shaw's report, indicates the remarkable differences in frequency of A and also of A and B grades, that is, very superior and superior intelligence, for officers of different arms of the service. Thus, for medical officers there are 27% of A grades; for engineers, 66%. Colonel Shaw remarks:

Comment on these figures is unnecessary. They speak for themselves. The only question is whether or not they represent a true state of affairs. With reference to the comparative efficiency of the officers of the various arms of the service I am not in a position to judge. I am of the opinion, however, that the order of mentality as shown by the psychological scores is fairly close to the truth. It is reasonable to believe that the engineers have succeeded in attaching to their corps a larger number of technically trained young men than any other branch of the service. It is also probable that the officers' training camps have drawn into the commissioned grades a larger number of college-trained men than either the Quartermaster or the Medical Corps.

The psychological findings, Colonel Shaw's comment thereupon and his recommendations to the Surgeon General aroused the critical interest of the medical profession. It was variously suggested that differences in age, education, basis of selection, or applicability of the intelligence tests might be responsible for the relatively unsatisfactory showing of medical officers. Because of the general interest in these results and the discussion which they provoked, their later correction or confirmation became important.

¹ On November 19 Colonel Shaw transmitted to the Surgeon General a special report on the psychological ratings of medical officers. This report is quoted entire in "Psychological Examining in the United States Army" (official report), *Memoirs of the National Academy of Sciences*, 15 (22-23). (In press.)

It is proposed to present in this report results which were secured during 1917 and 1918 in a large number of army camps and which undoubtedly represent fairly the officer personnel of the army with respect alike to its medical component and the other arms of the service. Colonel Shaw's report, by contrast, was based upon preliminary results in only one camp.

TABLE 1

Distribution of intelligence (Letter grades A to D) in different arms of the military service¹

Letter grades	All officers Percent	Medical Corps Percent	Engineers Percent	Artillery Percent	Infantry Percent	Quarter- master Corps Percent
A.....	44	27	66	57	44	40
B.....	32	33	29	31	38	32
C.....	24	40	5	12	18	28
D.....	0	0	0	0	0	0

Although approximately 43,000 officers were given psychological examination, the Division of Psychology of the Surgeon General's Office, because of limited resources, was able to use only about 15,000 of these records for statistical purposes. Of the 15,000 about 3000 were the records of medical officers. The intelligence measurements available for these men were studied by the aid of the Hollerith method and a very brief and general statement on the status of medical officers was prepared for the official report to the Surgeon General concerning psychological examining in the army (see tables 2 and 3 herewith). While this work was in progress Dr. Robert H. Halsey of New York suggested to the Chief of the Division of Psychology the importance of arranging for a careful and thorough-going study of the data on medical officers which were available in army records. Following this suggestion, the Division of Psychology secured the coöperation of the Division of Medicine and Related Sciences of the National Research Council, which supplied adequate funds for the work.

It was promptly arranged that Miss Margaret V. Cobb, under the supervision of the Chief of the Division of Psychology of the Sur-

¹ The letter grades are defined on page 467. The data of this table were obtained with army group-examination *a*, which was later revised and designated examination alpha, given to 1,166 officers, Camp Lee, Va. Percentages are taken from Table 1, p. 22, of the official report cited above.

geon General's Office, should conduct this special inquiry for the National Research Council and the Surgeon General of the Army.

METHODS AND MATERIALS

The statistical study of medical officers reported below was conducted in accordance with the following general plan and with the data which are hereafter enumerated. From the 3000 records of medical officers which were immediately available for use in the office of the Surgeon General, selection was made on the basis of completeness of information. This selectional process reduced the group to about 2500. There is every reason to believe that this group fairly represents the medical profession as it existed in the United States Army during the war, and it is probable that it also fairly represents the medical profession of the United States of America.

The following important items of information concerning each

Sample Record

Name.....	NG RA (RC) NA USA	Rank Lt. Col.
Residence.....	Pop. of community 475,367	Age 44
High sch. 0 1 (2) 3 4	Col. 0 1 2 (3) 4 5	Med. col. 0 1 2 3 (4) 5 6
Jefferson Medical College, Philadelphia, Pa.	Yr. grad. 1899	
Years of education: 17	Pre-med. 13	Med. 4
Training:	Hospital	Clinical

Alpha		Scott ratings					Certification, Indiana '01
Test	Score	1st	2nd	3rd	4th	5th	Years experience, 19
1	8	12	10	9	..	..	Societies, Los Angeles Co.
2	8	15	12	12	..	..	Med. Soc.; California State
3	12	15	12	12	..	..	Med. Soc.; Clin. and Pathol.
4	34	15	12	12	..	..	Med. Soc.; Am. Acad. Med.
5	18	40	32	30	..	..	Sciences; Am. Med. Ass.
6	12	..	..	..	..	..	Specialty, Internal medicine
7	13	..	..	..	..	..	Assignment, Permanent Staff
8	35	..	..	..	..	..	Promotions, Maj. to Lt.-Col.
Total	140	97	78	75			Professional examination, Qualified
Rating	A						Annual earnings, \$42,500.00
							Station, Camp Lewis

individual were available in the files of the Surgeon General's office: name, residence, age, rank, promotions and military assignment, pre-medical education, medical education, medical school, hospital experience, intelligence grade, Scott rating, place of certification, years of medical experience, membership in medical societies, specialty and annual earnings.

These several items were assembled for statistical purposes on a single record card, such as appears in the accompanying sample records of four medical officers. These samples are presented to indicate the nature and arrangement of the information which was available and the contrast among medical officers.

Sample Record

Name..... NG RA (RC) NA USA **Rank** Captain
Residence..... **Pop. of community** 745,988 **Age** 39
High sch. 0 1 2 (3) 4 **Col.** 0 1 2 3 4 5 **Med.col.** 0 1 2 3 (4) 5 6
 Baltimore Medical College, Baltimore, Md. **Yr. grad.** 1906
Years of education: 15 **Pre-med.** 11 **Med.** 4
Training: **Hospital,** Yes **Clinical**

Alpha		Scott ratings					Certification, Indiana, '06 Michigan, '07 Years experience, 12 Societies, St. Louis Med. Soc.; Acad. of O., L. and O.; Ind. State Med. Soc.; Mo. State Med. Soc. Specialty, Ear, nose and throat Assignment, Eye, ear, nose and throat Promotions, 0 Professional examination, Qualified Annual earnings, \$4000.00 Station, Camp Sherman
Test	Score	1st	2nd	3rd	4th	5th	
1	10	12	12	..	..	..
2	12	12	12	..	..	..
3	9	9	12	..	..	..
4	23	12	12	..	..	..
5	12	24	30	..	..	..
6	7	..	..	..	..	..
7	24	..	..	..	..	..
8	30	..	..	..	..	..
Total	127	69	78				
Rating	B						

Of the items of information available those of primary importance in this study are: Intelligence, pre-medical education, medical education, medical school attended, experience, geographical location, population of community and earnings.

Sample Record

Name NG RA (RC) NA USA **Rank** Lieutenant
Residence **Pop. of community** 200 **Age** 42
High sch. 0 1 2 3 (4) **Col.** 0 1 2 3 (4) 5 **Med. col.** 0 1 2 3 (4) 5 6
 Marquette University, Milwaukee, Wisconsin **Yr. grad.** 1910
Years of education: 20 **Pre-med.** 16 **Med.** 4
Training: **Hospital,** None **Clinical**

Alpha		Scott ratings					Certification, Wisconsin, '10; Minnesota, '11
Test	Score	1st	2nd	3rd	4th	5th	
1	5	6	9	8	7	9	Years experience, 8 Societies, Red River Valley Med. Ass.; Minn. Med. Ass.; A. M. A.
2	6	6	6	10	10	7	
3	3	6	6	9	7	10	
4	10	6	9	8	10	6	Specialty, General Practice
5	1	24	16	22	24	23	
6	7	..	..	..	..	..	Assignment, Field Service
7	5	..	..	..	..	..
8	11	..	..	..	..	..	Promotions, 0
	—	—	—	—	—	—	
Total	48	48	46	57	58	55	Professional examination, Barely satisfactory
Rating	C						
							Annual earnings, \$700 (country practice)
							Station, Camp Lewis

An attempt will be made to exhibit the principal facts with respect to these various data concerning medical officers, the relations of these facts among themselves, and their significance for medical education and professional activity.

For the benefit of readers who are not familiar with the army method of psychological examining or the Scott rating scale, a brief explanation of each will be given at this point.

Group Examination Alpha

The psychological examination given to the officers whose ratings are used in this report is known as examination alpha.¹ It was used for the examination of soldiers by groups and consisted of eight separate tests, the time limit on which was so short that

¹ Complete description of methods of psychological examining used in the army may be found in "Army Mental Tests," Henry Holt and Company, New York, 1920; or in "Psychological Examining in the United States Army" *Memoirs of the National Academy of Sciences*, 15. (In press).

Sample Record

Name..... NG RA (RC) NA USA Rank Captain
Residence..... Pop. of community 5,468 Age 51
High sch. (0) 1 2 3 4 Col. (0) 1 2 3 4 5 Med. Col. 0 1 2 (3) 4 5 6
Kentucky School of Medicine, Louisville, Ky. Yr. grad. 1892
Years of education: Pre-med. Med. 3
Training: Hospital Clinical

Alpha		Scott ratings					Certification, Ohio, '96
Test	Score	1st	2nd	3rd	4th	5th	Years experience, 26
1	1	7	..	..	..	..	Societies, Jackson Co. Med. Soc.; Ohio State Med. Soc.
2	3	9	..	..	..	..
3	4	7	..	..	..	..	Specialty, X-ray, rheumatism, skin and blood diseases
4	1	10	..	..	..	..	Assignment, General Service
5	1	15	..	..	..	..	Promotions, 0
6	1	..	..	..	..	..
7	3	..	..	..	..	..	Professional examination, Qualified
8	5	..	..	..	..	..
Total	19	45					Annual earnings, \$900
Rating	D						Station, Camp Greenleaf

very few men could finish a given test. These several tests are describable by title as: Test 1, oral directions; test 2, arithmetic; test 3, practical judgment; test 4, opposites; test 5, disarranged sentences; test 6, number series completion; test 7, analogies; test 8, information. The examination required approximately fifty minutes. Papers were scored by the use of stencil-keys and the ratings were wholly objective. Although a numerical score was assigned to each man, for convenience of classification letter grades were also used in the army. The maximum score for the examination was 212 points and the letter grades used were as follows:

Intelligence grade	Meaning of grade	Range of score
A	Very superior intelligence	135-212 points
B	Superior intelligence	105-134 points
C+	High average intelligence	75-104 points
C	Average intelligence	45-74 points
C—	Low average intelligence	25-44 points
D	Inferior intelligence	15-24 points
D—	Very inferior intelligence	0-14 points

The Scott Rating Scale

The Scott rating scale¹ is a plan for the rating of officers by their superiors. Each individual is rated, in accordance with definite directions, on five groups of characteristics, namely: physical qualities, intelligence, leadership, personal qualities, general value to the service. The total number of points allowed for these five categories is 100, distributed as follows: 15 for each of the first four groups, 40 for the last.

Comparison of the Scott ratings of medical officers, made during the assembling of the data for this report, indicated surprising inconsistencies between the ratings given to the same officer at different times. It was at first proposed to obtain an exact expression of this seeming unreliability of the ratings in order that safe decision might be reached concerning the value of these data. But before statistical analysis could be made an unpublished report on the Scott ratings prepared by H. O. Rugg became available.² The statements of this report clearly indicated the undesirability of using the Scott ratings for comparison with the other data of this report. They appear on the sample record cards on pages 464-467, but no statistical use has been made of them.

The results of professional medical examination in the army were not available when this work was undertaken. They would undoubtedly have value and it is regretted that they could not be included with the other materials.

DATA CONCERNING MEDICAL OFFICERS

Analysis of the records of approximately 2500 medical officers supplies data for the following general description of the group

¹ Detailed description of the Scott rating system and its results in the army is available in "The Personnel System of the United States Army: Vol. I, History of the Personnel System; Vol. II, The Personnel Manual." War Department, Washington, 1919.

² Dr. Rugg finds, after checking the ratings as to agreement of successive ratings with one another and as to their agreement with psychological and other objective tests and other measures supported by accepted practice in the army, that "prior to October the validity of ratings which were recorded on officers' qualification cards may be seriously called in question," and later adds "the probability is not great that the October ratings which were studied are much more valid as measures of officers' ability in the army than were the July ratings." There were average differences between the first and second quarterly ratings, even when made by the same officer, of nine points on the scale (this is at least one-sixth of the usual range of the scale); when different officers made the ratings average differences were from nine to seventeen points. Even among especially careful ratings he finds the variability of judgment to be "so very great that the probability is very remote that a single rating located an officer in his proper group" (*i. e.*, proper fifth of the range of the scale). This was true also under standardized experimental conditions.

in terms of age, geographical origin, intelligence, education, professional experience, earnings, membership in medical societies and specialty.

The average medical officer of the group studied is a man 37 years of age, practicing somewhere in the United States in a town of approximately 12,000 population, whose intelligence as measured by army examination alpha is of grade B (alpha score 129 points). Following a high school education, he was graduated, after a five-year medical course, in 1907, from a college of 250 students. His annual earnings are reported as \$4318.00. He is a member of two or three medical societies, the chances being even that one of these is the American Medical Association. There is also an even chance that he claims no specialty other than his general or surgical practice and that he was not promoted during his service in the army.

Intelligence of Medical Officers

Quantitative differences.—It would have surprised no one had the medical officers of the United States Army, during the war, ranked with the best of the arms of the service in intellectual ability; their failure to make a relatively good showing naturally evoked comment both within and without the profession and aroused speculation as to the reasons. The principal facts concerning the intellectual status of military officers are summarily presented in tables 2, 3 and 4 of this report. For more detailed information

TABLE 2

Percentage distribution of psychological grades for examination alpha of officers of different arms of the service.¹

Arm	D	C—	C+	C	B	A	A and B	No. of cases
Engineers.....			0.3	2.4	13.8	83.0	96.8	1026
F. Artillery.....			1.1	5.9	23.0	70.0	93.0	1523
Sanitary Corps.....			2.0	8.2	31.6	58.2	89.8	98
Field Sig. Bn.....	0.3	0.3	2.2	9.0	24.1	64.1	88.2	357
Mach. Gun Bn.....		0.4	2.2	10.7	30.1	56.5	86.6	495
Infantry.....		0.3	3.0	12.2	28.5	56.0	84.5	6942
Quartermaster.....		0.9	5.2	15.7	30.2	48.0	78.2	756
Medical.....		0.6	5.2	17.6	32.9	43.6	76.5	3180
Dental.....	0.2	0.2	4.0	20.4	41.1	34.1	75.2	423
Veterinary.....		0.4	7.9	30.8	38.7	22.1	60.8	98

¹ Official report, table 397, p. 852.

and discussion reference should be made to the official report on psychological examining cited on page 462.

The proportions of the several letter grades for the chief army corps or arms of the service appear in table 2. They are arranged in order of diminishing number of A and B grades. The remarkable difference in the frequency of superior and very superior intelligence in the Medical Corps as compared with the Engineer Corps demands explanation. Over twice as many of the officers of the latter

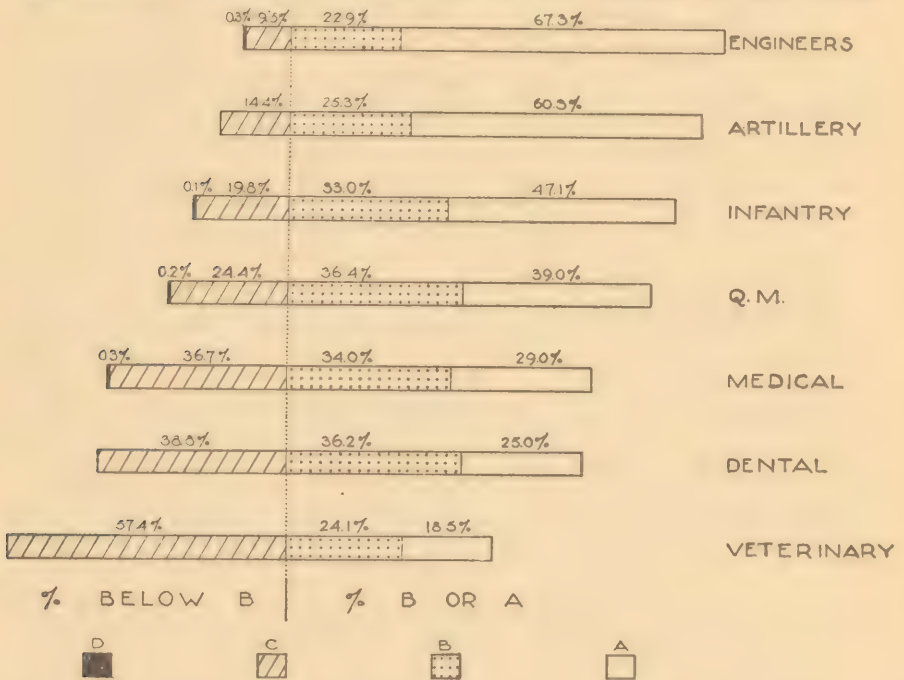


Fig. 1. Comparison of officers by arms, showing percentages in each letter grade. Combined data from Camps Devens, Dix, Lee and Taylor. Engineers, 336; Artillery, 680; Infantry, 2,050; Quartermaster Corps, 470; Medical, 639; Dental, 116; Veterinary, 54.

This is fig. 22, p. 518, Official report on psychological examining.

group as of the former achieved the highest letter rating, A. Figure 1 presents graphically these data summarized for purposes of rough comparison.

Table 3 renders available to anyone who may wish to study the data the distribution of scores in psychological examination alpha for more than 15,000 army officers. The median scores for these several distributions are of special interest and importance in this report. Except that Field Artillery and Sanitary Corps are

TABLE 3
Percentage distribution of alpha scores of officers in different arms of the service (from 16 camps)¹

Score	Infantry	F. Artillery	Machine Gun Bn.	Engineers	Field Signal Bn.	Quartermaster Corps	Medical Corps	Dental Corps	Veterinary Corps	Sanitary Corps	Chaplains and School for Chaplains	Total	Total numbers
200-212	0 2	0 4	0 2	1 2	1 4	0 1	0 8	...	...	3 0	1 1	0 3	38
190-199	2 0	2 5	2 6	6 0	3 7	1 9	3 1	...	...	6 2	5 4	2 1	320
180-189	4 8	7 3	4 8	12 5	7 8	2 7	5 6	0 7	0 8	2 0	10 7	5 0	757
170-179	7 8	11 5	5 8	15 1	8 7	7 5	7 6	2 6	0 8	10 2	16 0	7 9	1201
160-169	10 3	13 8	13 6	18 5	12 1	8 1	10 0	5 7	2 4	15 3	10 7	10 4	1581
150-159	12 7	13 8	11 5	13 8	15 1	10 4	10 7	6 9	6 0	16 3	13 8	11 9	1810
140-149	12 2	14 3	11 7	12 2	10 6	12 4	11 6	11 6	9 1	8 2	8 5	11 9	1805
130-139	12 2	12 7	13 9	7 9	11 2	11 5	11 6	12 8	16 2	9 2	11 7	11 8	1785
120-129	10 5	8 3	12 5	4 2	8 4	11 5	11 0	13 3	13 4	6 1	9 5	10 3	1534
110-119	8 6	6 4	6 4	3 6	5 0	6 9	8 9	12 1	8 3	3 1	5 3	8 5	1287
100-110	6 5	3 6	5 4	2 6	5 6	9 1	6 6	7 8	13 4	5 1	2 2	6 7	1013
90-99	4 7	2 1	3 8	1 4	3 1	5 4	4 9	6 6	9 1	2 0	2 1	4 9	731
80-89	3 3	1 6	3 4	0 4	3 4	3 3	3 0	2 4	5 2	3 0	2 2	2 0	305
70-79	1 9	0 8	1 6	0 3	1 4	1 7	2 2	1 9	3 2	...	...	1 4	204
60-69	1 3	0 5	1 4	0 1	1 4	1 1	1 4	0 9	2 4	...	...	0 9	125
50-59	0 7	0 3	0 6	0 1	0 3	0 6	0 7	0 7	0 8	...	...	0 4	54
40-49	0 3	...	...	...	0 3	0 3	0 3	...	...	...	...	0 2	28
30-39	0 2	...	...	...	0 3	0 3	0 1	0 2	...	...	...	0 1	11
20-29	...	...	...	...	...	...	...	0 2	...	...	...	...	3
10-19	...	...	...	...	...	...	...	0 2	...	...	...	...	1
0-9	...	...	0 2	...	...	...	...	...	...	...	...	...	...
No. cases...	6942	1523	496	1026	357	756	3180	423	253	98	94	...	15148
Median....	139.8	149.5	140.6	162.1	148.9	133.6	129.3	122.9	116.5	151.4	156.3	139.6	...

¹ Data obtained from Official Report, tables 392-397, pp. 848-852.

reversed, their order of increasing magnitude is identical with the order of increasing A and B grades in the arms of the service.

The distribution of alpha scores for the group of 2507 medical officers whose records constitute the material of this special report, as presented in table 4, agrees closely with that for the somewhat larger group of medical officers in table 3. The median scores of the two groups, it will be noted, differ by one-tenth point.

In connection with these distributions and median scores, the attention of the reader is invited to the very considerable differences in the intellectual status of the several corps (medical, dental, veterinary, sanitary), which are included in the Medical Department of the United States Army. The relation of these differences to the data for other arms of the service is significant, and in the following pages an attempt will be made to indicate what appear to be the chief reasons for the wide variations in intelligence among the principal corps.

TABLE 4
Alpha distribution of 2507 medical officers

Alpha score	Number	Percentage
200-204	3	0.1
190-199	22	0.9
180-189	77	3.0
170-179	131	5.3
160-169	195	7.8
150-159	250	10.0
140-149	267	10.6
130-139	287	11.4
120-129	276	11.0
110-119	285	11.4
100-109	227	9.1
90-99	171	6.8
80-89	121	4.9
70-79	76	3.1
60-69	53	2.1
50-59	37	1.5
40-49	19	0.8
30-39	7	0.2
20-29	2	0.1
10-19	1	0.0
Total	2507	.....
Median	129.2	.....

The quantitative differences in intelligence of groups of army officers indicated by total scores in examination alpha are undoubtedly important, but they are by no means so interesting either professionally or educationally as are the contrasts which appear when the results for examination alpha are presented by tests instead of by total scores. In the following section the data of examination are presented by tests, in order to indicate characteristic intellectual differences in the principal arms of the service.

Psychographs. Examination alpha consists of eight separate tests (see page 467) which measure several types of intellectual function. The maximum score for the entire examination is 212 points distributed as follows among the tests: Test 1, 12 points; test 2, 20 points; test 3, 16 points; test 4, 40 points; test 5, 24 points; test 6, 20 points; test 7, 40 points; test 8, 40 points. The records of a group of approximately 15,000 officers of all arms of the service and of a group of approximately 3000 medical officers have been analyzed by tests in order that comparison might be made of the performance of medical officers on the several types of test with that of officers in general. The data for this comparison appear in tables 5, 6 and 7. Of these, table 5*a* gives the percentage distribution of scores for each alpha test of officers of all arms of the service, and table 5*b* the percentage of individuals achieving not more than the indicated score. This table serves as a standard with which the data for special groups may be compared. Table 6 similarly gives the percentage distribution of scores on each alpha test for medical officers. At the bottom of each table the median score for each test is entered.

The data by tests for the principal arms of the service are conveniently arranged in table 7, which gives the median score (50th percentile) on each test of examination alpha for seven special groups of officers as contrasted with the total officer group.

For convenience of comparison the median score of "all arms" of the service is taken as the 50th percentile, and the results for the several special groups are expressed in terms of the percentile distribution of "all arms." For example, the median score for medical officers on test 1 (8.7) falls at the 29.5 percentile on the distribution of scores of officers of all arms; the median for test 2 falls at the 36th percentile, etc., as indicated in table 7, and also in figure 2.

The surprising differences in performance for the several arms of the service on the separate tests of examination alpha are

TABLE 5a

Percentage distribution of scores on each alpha test of
approximately 15,000 officers of all arms

Score	Test number							
	1	2	3	4	5	6	7	8
40	.....	.....	.....	2.4	.....	.....	1.0	0.7
39	.....	.....	.....	0.3	.....	.....	1.5	2.4
38	.....	.....	.....	3.6	.....	.....	1.8	3.8
37	.....	.....	.....	0.9	.....	.....	2.3	5.4
36	.....	.....	.....	3.7	.....	.....	2.6	6.5
35	.....	.....	.....	2.1	.....	.....	2.5	7.0
34	.....	.....	.....	3.9	.....	.....	2.9	7.4
33	.....	.....	.....	2.9	.....	.....	3.0	7.6
32	.....	.....	.....	4.5	.....	.....	3.0	7.1
31	.....	.....	.....	3.8	.....	.....	3.2	6.5
30	.....	.....	.....	5.0	.....	.....	3.1	6.3
29	.....	.....	.....	4.4	.....	.....	3.2	5.4
28	.....	.....	.....	5.3	.....	.....	3.7	4.8
27	.....	.....	.....	4.7	.....	.....	3.6	4.3
26	.....	.....	.....	5.4	.....	.....	3.9	3.4
25	.....	.....	.....	4.7	.....	.....	3.6	3.2
24	.....	.....	.....	5.0	7.0	.....	3.7	2.5
23	.....	.....	.....	4.2	1.4	.....	3.4	2.1
22	.....	.....	.....	4.5	8.8	.....	3.2	2.0
21	.....	.....	.....	3.8	3.5	.....	2.9	1.8
20	.....	0.0	.....	3.4	9.0	0.4	2.7	1.5
19	.....	1.3	.....	2.8	5.1	0.2	2.3	1.6
18	.....	2.6	.....	3.0	9.0	2.2	2.1	1.1
17	.....	5.4	.....	2.1	5.9	2.8	2.3	0.9
16	.....	6.8	4.6	2.1	7.9	4.2	2.2	1.0
15	.....	8.6	7.5	1.8	5.7	5.9	2.0	0.8
14	.....	10.9	8.8	1.6	7.0	6.6	2.3	0.7
13	.....	12.8	11.6	1.3	5.3	8.6	2.3	0.6
12	9.5	14.2	12.6	1.1	5.5	12.0	2.5	0.4
11	18.6	13.0	12.3	0.9	4.1	13.4	2.3	0.4
10	20.6	9.9	12.6	0.8	3.8	13.2	2.5	0.2
9	17.9	5.2	11.3	0.6	2.6	10.4	2.5	0.2
8	13.0	4.5	9.0	0.6	2.0	7.0	2.4	0.1
7	8.7	1.8	5.4	0.3	1.4	4.9	2.4	0.1
6	6.0	1.4	2.4	0.4	1.0	3.0	2.0	0.0
5	3.0	0.8	0.8	0.3	1.0	1.6	2.0	0.0
4	1.5	0.4	0.4	0.3	0.7	1.0	1.7	0.0
3	0.8	0.2	0.2	0.2	0.5	0.6	1.3	0.0
2	0.3	0.1	0.1	0.2	0.5	0.6	1.0	0.0
1	0.1	0.0	0.1	0.1	0.2	0.7	0.6	....
0	0.0	0.0	0.2	1.2	1.1	0.8	0.6	0.1
Median	9.9	12.9	11.6	26.5	17.0	11.5	23.6	31.7
Maximum	12	20	16	40	24	20	40	40

TABLE 5b

Percentile distribution of scores on each alpha test of
approximately 15,000 officers of all arms

Score	Test number							
	1	2	3	4	5	6	7	8
40	.....	.....	.....	100.2	.....	.....	100.1	99.9
39	.....	.....	.....	97.8	.....	.....	99.1	99.2
38	.....	.....	.....	97.5	.....	.....	97.6	96.8
37	.....	.....	.....	93.9	.....	.....	95.8	93.0
36	.....	.....	.....	93.0	.....	.....	93.5	87.6
35	.....	.....	.....	89.3	.....	.....	90.9	81.1
34	.....	.....	.....	87.2	.....	.....	88.4	74.1
33	.....	.....	.....	83.3	.....	.....	85.5	66.7
32	.....	.....	.....	80.4	.....	.....	82.5	59.1
31	.....	.....	.....	75.9	.....	.....	79.5	52.0
30	.....	.....	.....	72.1	.....	.....	76.3	45.5
29	.....	.....	.....	67.1	.....	.....	73.2	39.2
28	.....	.....	.....	62.7	.....	.....	70.0	33.8
27	.....	.....	.....	57.4	.....	.....	66.3	29.0
26	.....	.....	.....	52.7	.....	.....	62.7	24.7
25	.....	.....	.....	47.3	.....	.....	58.8	21.3
24	.....	.....	.....	42.6	100.0	.....	55.2	18.1
23	.....	.....	.....	37.6	93.0	.....	51.5	15.6
22	.....	.....	.....	33.4	91.6	.....	48.1	13.5
21	.....	.....	.....	28.9	82.8	.....	44.9	11.5
20	.....	00.0	.....	25.1	79.3	100.1	42.0	9.7
19	.....	69.9	.....	21.7	70.3	99.7	39.3	8.2
18	.....	98.6	.....	18.9	65.2	99.5	37.0	6.6
17	.....	96.0	.....	15.9	56.2	97.3	34.9	5.5
16	.....	90.6	99.9	13.8	50.3	94.5	32.6	4.6
15	.....	83.8	95.3	11.7	42.4	90.3	30.4	3.6
14	.....	75.2	87.8	9.9	36.7	84.4	28.4	2.8
13	.....	64.3	79.0	8.3	29.7	77.8	26.1	2.1
12	100.0	51.5	67.4	7.0	24.4	69.2	23.8	1.5
11	90.5	37.3	54.8	5.9	18.9	57.2	21.3	1.1
10	71.9	24.3	42.5	5.0	14.8	43.8	19.0	0.7
9	51.3	14.4	29.9	4.2	11.0	30.6	16.5	0.5
8	33.4	9.2	18.6	3.6	8.4	20.2	14.0	0.3
7	20.4	4.7	9.6	3.0	6.4	13.2	11.6	0.2
6	11.7	2.9	4.2	2.7	5.0	8.3	9.2	0.1
5	5.7	1.5	1.8	2.3	4.0	5.3	7.2	0.1
4	2.7	0.7	1.0	2.0	3.0	3.7	5.2	0.1
3	1.2	0.3	0.6	1.7	2.3	2.7	3.5	0.1
2	0.4	0.1	0.4	1.5	1.8	2.1	2.2	0.1
1	0.1	0.0	0.3	1.3	1.3	1.5	1.2	0.1
0	0.0	0.0	0.2	1.2	1.1	0.8	0.6	0.1
Median	9.9	12.9	11.6	26.5	17.0	11.5	23.6	31.7
Maximum	12	20	16	40	24	20	40	40

TABLE 6

Percentage distribution of scores on each alpha test of
approximately 3,000 medical officers

Score	Test number							
	1	2	3	4	5	6	7	8
40.....	.....	.....	.....	1.7	....	.....	0.4	0.8
39.....	.....	.....	.....	0.4	....	.....	0.9	2.3
38.....	.....	.....	.....	3.5	....	.....	0.6	4.2
37.....	.....	.....	.....	1.0	....	.....	1.3	5.7
36.....	.....	.....	.....	4.0	....	.....	1.9	7.2
35.....	.....	.....	.....	2.4	....	.....	1.5	6.6
34.....	.....	.....	.....	3.5	....	.....	1.7	7.2
33.....	.....	.....	.....	3.3	....	.....	1.9	7.1
32.....	.....	.....	.....	4.9	....	.....	2.0	6.3
31.....	.....	.....	.....	3.7	....	.....	2.0	5.9
30.....	.....	.....	.....	3.9	....	.....	2.1	5.9
29.....	.....	.....	.....	4.4	....	.....	2.4	4.7
28.....	.....	.....	.....	5.1	....	.....	2.3	4.7
27.....	.....	.....	.....	4.7	....	.....	2.7	3.8
26.....	.....	.....	.....	4.6	....	.....	3.2	3.6
25.....	.....	.....	.....	5.0	....	.....	2.5	3.2
24.....	.....	.....	.....	5.3	4.4	.....	3.4	2.3
23.....	.....	.....	.....	4.4	1.5	.....	3.2	2.2
22.....	.....	.....	.....	4.2	7.0	.....	3.2	1.9
21.....	.....	.....	.....	4.2	3.4	.....	2.7	2.0
20.....	.....	0.1	.....	3.1	6.9	0.2	2.5	1.9
19.....	.....	0.5	.....	2.6	5.6	0.3	2.5	1.9
18.....	.....	1.1	.....	2.6	9.0	0.6	2.3	1.1
17.....	.....	2.3	.....	2.3	6.3	1.0	2.5	1.0
16.....	.....	4.0	2.5	2.0	8.1	2.0	2.5	1.3
15.....	.....	5.6	5.2	1.5	6.2	2.9	2.3	1.2
14.....	.....	8.3	7.4	1.6	7.1	4.3	3.3	0.9
13.....	.....	11.9	9.6	1.2	5.8	5.7	3.3	0.9
12.....	3.6	14.7	11.7	1.1	5.7	10.2	3.3	0.3
11.....	8.5	13.3	11.0	0.9	4.4	13.6	2.8	0.4
10.....	15.1	13.6	13.2	0.9	4.2	15.7	3.5	0.3
9.....	18.2	9.5	13.1	0.6	3.4	12.7	3.3	0.3
8.....	17.2	6.0	11.6	0.6	2.4	10.4	2.7	0.1
7.....	13.8	4.3	7.8	0.5	1.7	7.2	3.8	0.2
6.....	11.0	2.4	3.6	0.4	1.3	4.6	3.3	0.1
5.....	6.3	1.2	1.4	0.3	1.3	2.4	3.4	0.1
4.....	3.6	0.7	0.7	0.3	0.9	1.3	3.3	0.1
3.....	1.9	0.2	0.4	0.3	0.7	1.0	2.5	0.0
2.....	0.6	0.2	0.2	0.1	0.8	1.2	2.1	0.0
1.....	0.3	0.1	0.1	0.2	0.2	1.2	1.5	0.0
0.....	0.0	0.0	0.3	2.4	1.7	1.7	1.2	0.1
Median....	8.7	11.9	10.8	26.3	16.3	10.4	17.7	31.6
Maximum....	12	20	16	40	24	20	40	40

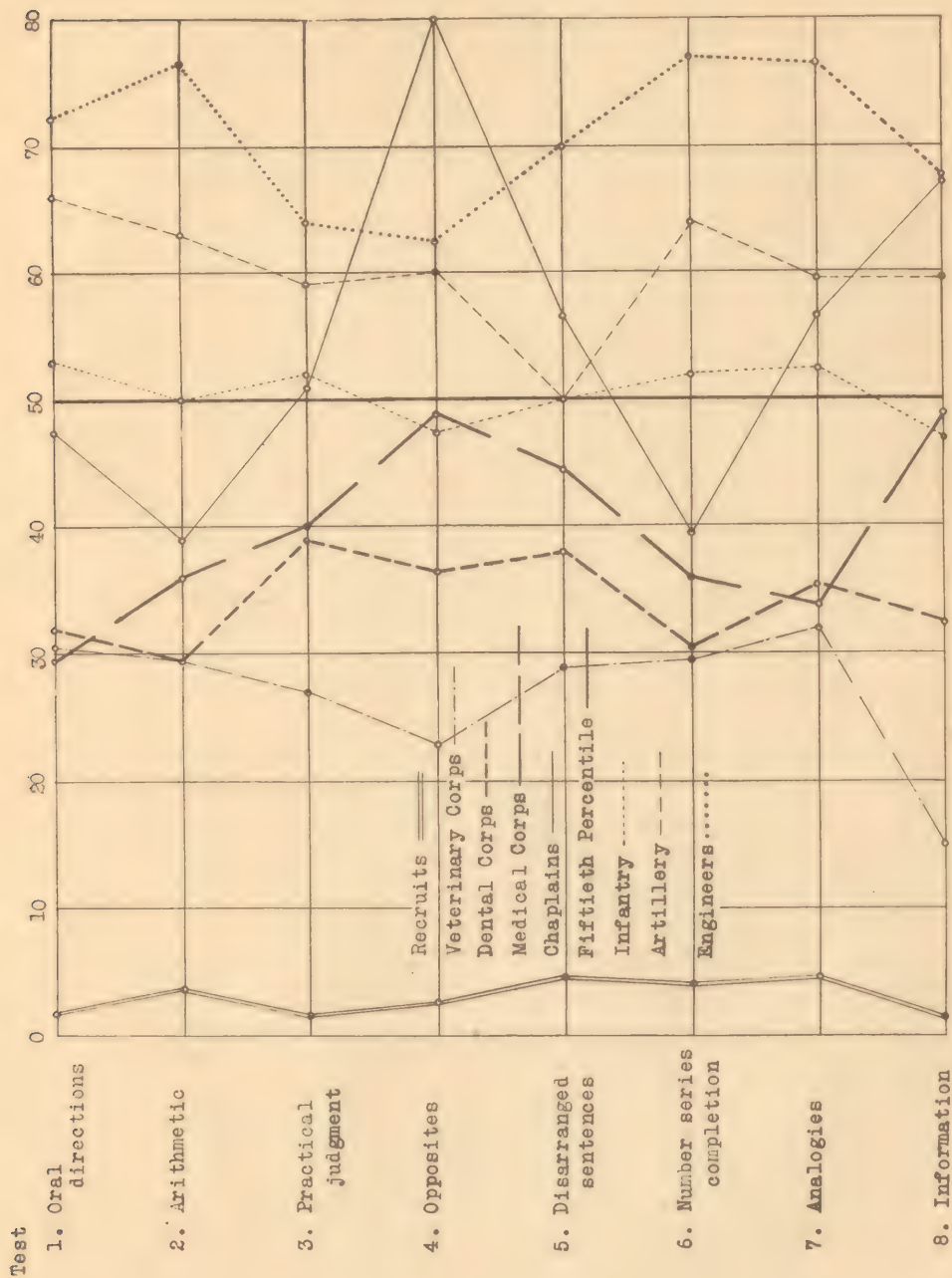


Fig. 2. Psychographs for representative groups of military officers.

TABLE 7

Median (50th percentile) score on alpha tests of officers in different arms of the service, compared with standard group of officers of all arms.

Arm of the service	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7	Test 8	Total
Medical officers (Percentile reached)	8.7 (29.5)	11.9 (36.0)	10.8 (40.0)	26.3 (49.0)	16.3 (44.5)	10.4 (36.0)	17.7 (34.0)	31.6 (49.0)	129.3
Infantry (Percentile reached)	10.1 (53.0)	12.9 (50.0)	11.8 (52.0)	26.0 (47.5)	17.0 (50.0)	11.6 (52.0)	24.2 (52.5)	31.2 (47.0)	139.8
Artillery (Percentile reached)	10.7 (66.0)	13.9 (63.0)	12.3 (59.0)	28.6 (60.0)	17.0 (50.0)	12.5 (64.0)	26.2 (59.5)	33.0 (59.5)	149.5
Engineers (Percentile reached)	11.0 (72.0)	15.1 (76.5)	12.7 (64.0)	29.1 (62.5)	19.9 (70.0)	13.9 (77.0)	31.0 (76.5)	34.2 (67.5)	162.1
Dental (Percentile reached)	8.9 (32.0)	11.4 (29.5)	10.7 (39.0)	23.7 (36.5)	15.2 (38.0)	10.0 (30.5)	18.3 (35.5)	28.7 (32.5)	122.9
Veterinary (Percentile reached)	8.8 (30.5)	11.4 (29.5)	9.8 (27.0)	20.5 (23.0)	13.8 (29.0)	9.9 (29.5)	16.6 (32.0)	23.8 (15.0)	116.5
Chaplains (Percentile reached)	9.8 (47.5)	12.1 (39.0)	11.7 (51.0)	33.0 (80.0)	18.0 (56.5)	10.7 (39.5)	25.3 (56.5)	34.0 (67.0)	156.3
All arms (Percentile reached)	9.9 (50.0)	12.9 (50.0)	11.6 (50.0)	26.5 (50.0)	17.0 (50.0)	11.5 (50.0)	23.6 (50.0)	31.7 (50.0)	139.6
Maximum score for test	12	20	16	40	24	20	40	40	212

visualized in figure 2, which indicates, among other things, that the score of medical officers is in no case as high as the median score of all arms of the service which is represented in the figure by the heavy 50th percentile line. The curves of figure 2 are known as psychographs. It is peculiarly interesting to note that the psychograph of medical officers is very nearly the inverse of that for engineers. In other words, where the engineer tests particularly well the medical officer tests poorly, and conversely. The psychograph for the infantry corresponds most nearly to the standard. This is partly because it is by far the largest special group in the total and therefore affects the standard most markedly. The chaplains' psychograph is notable because of the extreme variation in scores; thus on test 4 (opposites) the chaplains achieve a median score which is much higher than that of any other group, whereas on tests 2 (arithmetic) and 6 (number series completion) they fall considerably below the median for all officers. It is worthy of note that for only three groups, namely, the medical, dental and veterinary, do the psychographs as a whole fall below the standard for comparison.

In order to discover whether the psychograph for medical officers presented in figure 2 is really characteristic of the professional group, the group was subdivided according to the principal specialties represented, of which there are nine, as listed in table 8. Of these, seven are represented in figure 3. This figure shows a striking resemblance among the psychographs of the special medical groups and justifies the statement that the medical psychograph is characteristic of the professional group. The fact that the

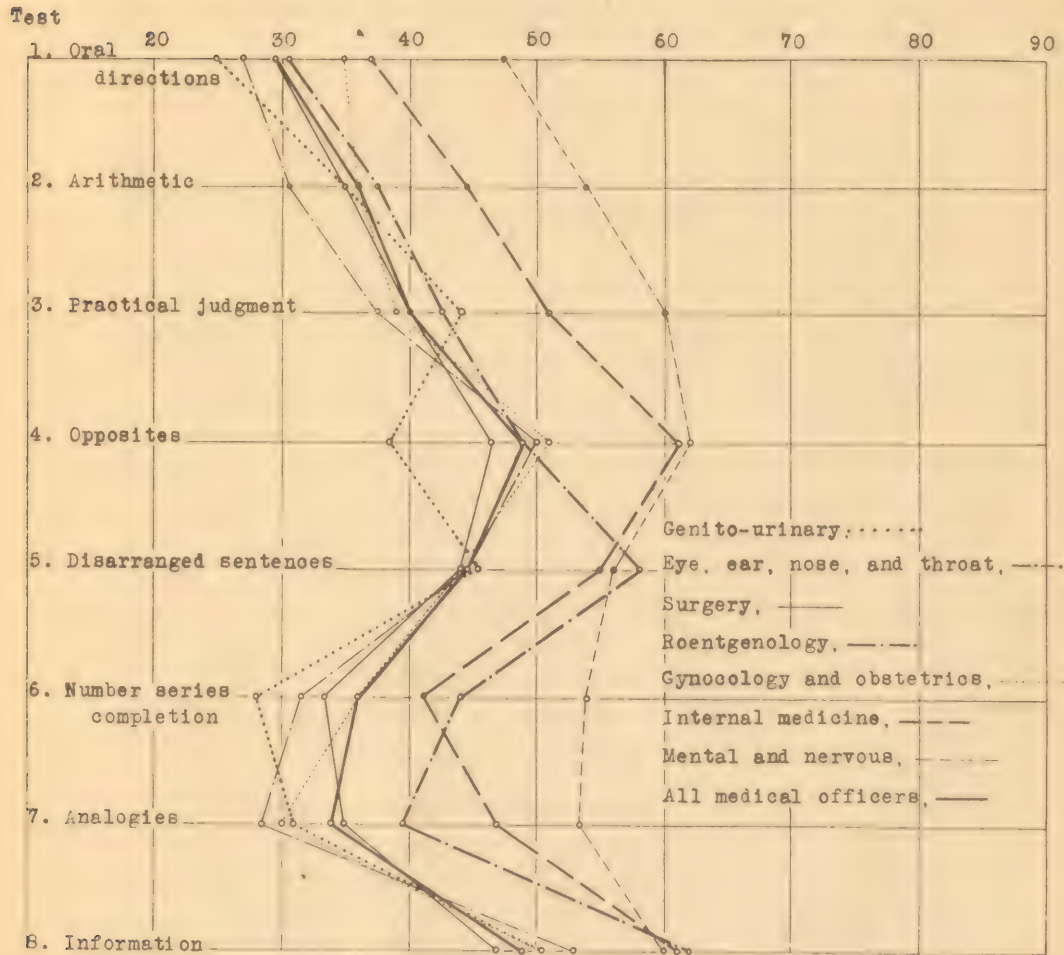


Fig. 3. Psychographs for medical specialists.

"mental and nervous" group stands well above the others is explainable on the basis of difference in the method of selection for appointment to the military service. It happens that the neuropsychiatric specialists were carefully selected and recommended to the Medical Department by a special committee which operated under the auspices of the National Committee for Mental Hygiene. The presumption is that the efforts of this committee eliminated a large proportion of intellectually low grade and professionally incompetent men.

On the chance that the psychograph for the medical profession

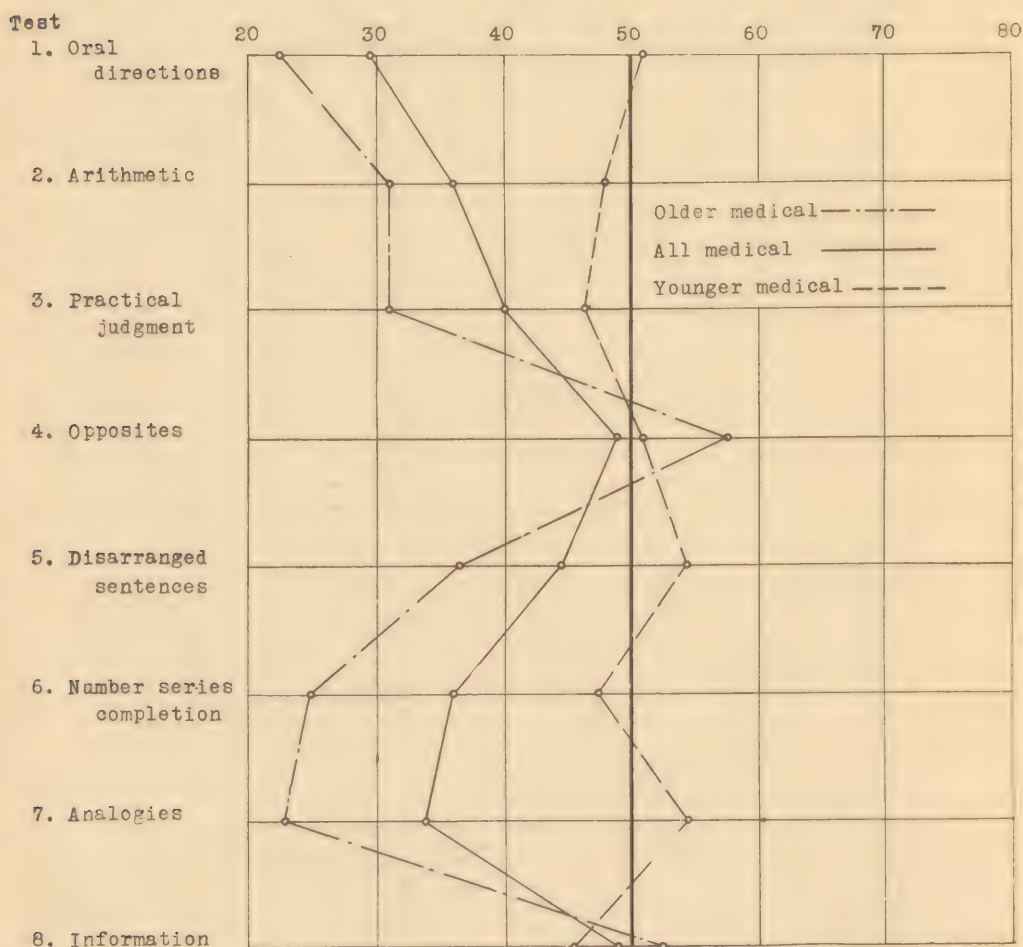


Fig. 4. Psychographs for age-groups of medical officers.

might vary significantly with age, the data for two small groups of medical officers were assembled for comparison. The one of these groups consisted of 140 individuals aged 26 years or less, the other of 144 individuals aged 50 years or more. The psychographs of

TABLE 8

Median (50th percentile) scores on alpha tests of specialists within the medical profession, compared with standard group of officers of all arms

Specialty	No. cases	Median score on alpha tests								Total alpha
		1	2	3	4	5	6	7	8	
Anesthesia	35	9.1	11.1	10.1	26.8	15.6	11.1	13.5	31.6	130.8
(Percentile reached)		(35.0)	(25.5)	(31.0)	(51.5)	(40.0)	(45.5)	(25.0)	(49.0)	
Eye	46	9.1	12.0	11.3	27.8	16.6	10.8	19.0	34.3	140.0
(Percentile reached)		(35.0)	(37.5)	(46.5)	(56.5)	(47.0)	(41.0)	(37.0)	(68.5)	
Eye, ear, nose and throat	175	8.5	11.5	10.6	26.5	16.3	10.1	14.9	32.1	128.3
(Percentile reached)		(27.0)	(30.5)	(37.5)	(50.0)	(44.5)	(31.5)	(28.5)	(53.0)	
Genito-urinary diseases	77	8.4	11.8	11.1	24.2	16.4	9.8	16.3	31.7	124.4
(Percentile reached)		(25.0)	(35.0)	(44.0)	(38.5)	(45.5)	(28.0)	(31.0)	(50.5)	
Gynecology and obstetrics	88	9.1	11.9	10.7	26.7	16.2	10.4	15.8	31.7	128.1
(Percentile reached)		(35.0)	(36.0)	(39.0)	(51.0)	(44.0)	(36.0)	(30.0)	(50.5)	
Internal medicine	178	9.2	12.5	11.7	28.8	17.8	10.8	22.8	33.2	143.6
(Percentile reached)		(37.0)	(44.5)	(51.0)	(61.0)	(55.0)	(41.0)	(47.0)	(61.0)	
Mental and nervous diseases	54	9.8	13.2	12.4	29.0	17.9	11.7	24.6	33.1	143.0
(Percentile reached)		(47.5)	(54.0)	(60.0)	(62.0)	(56.0)	(54.0)	(53.5)	(60.0)	
Roentgenology	54	8.8	12.0	11.0	26.3	18.2	11.0	20.0	33.3	136.0
(Percentile reached)		(30.5)	(37.5)	(42.5)	(49.0)	(58.0)	(44.0)	(39.5)	(62.0)	
Surgery	640	8.7	11.8	10.8	25.8	16.2	10.3	18.0	31.2	127.4
(Percentile reached)		(29.5)	(35.0)	(40.0)	(46.5)	(44.0)	(33.5)	(35.0)	(47.0)	
All medical officers	3165	8.7	11.9	10.8	26.3	16.3	10.4	17.7	31.6	129.3
(Percentile reached)		(29.5)	(36.0)	(40.0)	(49.0)	(44.5)	(36.0)	(34.0)	(49.0)	
Eye, ear, nose and throat, promoted	35	9.6	11.7	10.9	29.5	18.2	10.7	16.6	33.1	
(Percentile reached)		(34.0)	(33.5)	(41.5)	(64.5)	(58.0)	(39.5)	(32.0)	(60.0)	
Eye, ear, nose and throat. Not known to be promoted	140	8.1	11.4	10.5	25.9	15.5	9.9	14.0	31.6	
(Percentile reached)		(21.0)	(29.5)	(36.5)	(47.0)	(39.5)	(29.5)	(26.0)	(49.0)	

these two medical groups (as appears in figure 4) differ in two obviously important respects. That for the younger group closely approximates the 50th percentile standard and is similar in form to the psychograph for infantry officers. That for the older group falls even farther below the standard than the psychograph for all medical officers and its form is an accentuation of the peculiarities of the medical psychograph which has been considered in an earlier paragraph.

Comparison of figures 2 and 4 indicates a certain similarity between the psychograph of chaplains (figure 2) and that of older medical officers (fig. 4). The median age of the chaplains is 31.8 years. It is possible that a group of engineers of approximately the same age as the medical officers would yield a psychograph similar to theirs and radically different from that of the army engineers. It appears, then, that age may influence the form of psychograph.

The influence of language habits, in relation to age, appears in the results for the "opposites" test. The score for this test, as also for the "information" test, is larger for the older medical officers.

The psychographs of such professional groups as medical, veterinary, engineer, chaplains, may prove to have either educational or vocational significance, or possibly both. Should further inquiry indicate that they are characteristic of the student groups which enter the several types of school, respectively, it would seem that they might serve as partial basis for vocational advice. If, on the contrary, they are the product of professional training and experience, they should prove useful in connection with educational methods. In any event, it is clear that this subject deserves further and immediate attention, since it may possibly yield information which will serve to improve the status of the medical profession either through more satisfactory selection of medical students or through their more effective training.

Age of Medical Officers

It was early suggested that greater age of medical officers might be responsible for their relatively low intelligence rating. The facts presented on pp. 480, 481 and in this section wholly justify this surmise. In the first place it appears from table 9 that the median age of officers of the Medical Corps is 37.6 years, whereas that of all officers is 28.8. The nearest approach to the median age of medical

TABLE 9

Age distribution of officers. Figures are percentage distributions for different arms of the service¹

Arm	Age-group (years)									Median age	Number of cases
	20 and less	21-22	23-24	25-26	27-28	29-30	31-40	41-50	51-60		
Infantry	0.3	8.9	19.8	19.7	15.1	11.1	20.0	4.7	0.4	27.2	6812
Artillery	0.1	11.3	23.4	20.4	15.6	12.2	15.3	1.7	0.0	26.5	1507
Machine gun battalions	0.0	10.6	21.2	18.9	16.2	8.5	19.9	4.7	0.0	26.9	493
Engineers	0.1	6.7	16.9	17.2	16.0	12.2	25.6	4.5	0.5	28.1	984
Field Signal Corps	0.3	5.5	14.7	16.4	13.2	13.5	27.9	8.6	0.3	29.0	350
Quartermaster Corps	0.1	4.0	13.2	15.4	16.6	12.4	25.0	11.9	1.1	29.1	747
Medical Corps	0.0	0.0	2.2	4.8	7.3	8.1	42.0	30.1	5.6	37.6	3090
Dental Corps	0.0	3.9	16.8	25.0	16.8	14.2	17.2	6.0	0.0	27.5	413
Veterinary Corps	0.0	3.2	13.6	16.7	22.0	15.1	26.7	2.4	0.4	28.5	251
All officers	0.2	6.4	15.2	15.9	13.8	10.9	25.8	10.6	0.1	28.8	15385

officers is that of the Quartermaster Corps, 29.1. It thus appears that the median medical officer is approximately 9 years older than his median military associate.

That intelligence is related to age has been demonstrated by the analysis of mental measurements made in the army. In general the intelligence rating tends to diminish with age. That this is due to age alone and not to selectional processes operating in connection with age is by no means certain. The above statements are based upon such data as are reproduced in the accompanying tables 10 and 11. No special study, in addition to the comparison instituted in figure 4, has been made of the relation of age to intelligence in the particular group of medical officers under consideration. From table 10 it appears that there is no regular or significant decrease in intelligence rating from 20 to 26 years. Thereafter to the age of 60 there is a marked decrease. The median for the age group 31 to 40 years (within which the age of medical officers falls) is 133 points, whereas that for the age group of officers in general is about 143 points. Particularly significant are the data of table 11 for the large group of medical officers examined at Camp Greenleaf with army examination *a*. It should be mentioned

¹ Official report, table 372, p. 818.

that the median scores of this table are much larger than those of previous tables because the maximum score for examination *a* is 414 points, whereas that for examination alpha is 212 points. These medians indicate that a medical officer above 30 years of age is at a disadvantage in the intelligence examination *a*, as compared with an officer under 30 years of age. Finally, the following

TABLE 10
Relation of age to intelligence for 15,385 officers given
examination alpha¹

Intelligence rating	20 and less	21-22	23-24	25-26	27-28	29-30	31-40	41-50	51-60	60 up
A.....	66.8	66.9	63.6	60.3	60.3	57.4	49.1	40.0	34.0	62.5
B.....	29.2	24.7	27.7	28.3	25.9	28.1	30.1	31.4	32.7	25.0
C+.....	4.2	6.5	7.8	9.7	11.1	11.6	15.5	21.1	21.2	0.0
C.....		1.5	1.2	1.8	2.2	2.4	4.9	6.4	10.2	12.5
C—.....		0.1	0.1		0.1	0.1	0.6	0.7	2.0	
D.....						0.1		0.3		
D—.....										
Median.....	150	146	146	147	143	141	133	125	120	140
Number of cases.....	24	985	2,330	2,434	2,101	1,665	3,963	1,635	240	8
Percent of total number of cases.....	0.2	6.4	15.2	15.9	13.8	10.9	25.8	10.6	1.6	0.1

coefficients of correlation between age and score in examination *a* are offered in justification of the conclusion that age is negatively correlated to a significant degree with intelligence rating:²

5,404 medical officers, Camp Greenleaf.....	—0.192
2,475 medical officers, Camp Greenleaf, 21-30 years.....	—0.063 (P. E. 0.013)
3,267 medical officers, Camp Greenleaf, 30-60 years.....	—0.192 (P. E. 0.011)
146 medical officers, Camp Devens.....	—0.011
308 infantry officers, Camp Devens.....	—0.120

Four principal causes have been suggested for the relatively low intelligence rating of medical officers. These are, first, lack of agility and speed in the examination because of age; second, tendency to work carefully and accurately as a result of professional training and experience; third, special characteristics of tests rendering them easier for men of mathematical and mechanical training

¹ Official report, table 366, p. 814.

² *Ibid.*, p. 817.

TABLE 11

Relation of intelligence to age of 5,742 medical officers,
Camp Greenleaf, given examination α ¹

2,475 of draft age

Statistical measurement	Age									
	21	22	23	24	25	26	27	28	29	30
Median.....	232	273	269	273	277	267	265	266	261	258
Number of cases.....	11	52	132	241	303	376	361	352	338	309

3,267 over draft age

Statistical measurement	30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55
Median.....	254	259	262	252	255	255	246	235	242	237	223	214	212
Number of cases....	582	330	257	301	301	305	279	241	219	172	131	82	63

than for medical officers; and fourth, method of selection for military appointment. These four possible factors will be considered briefly in order.

It is granted that increasing age tends to diminish the score in examinations α and α . The statistical data clearly indicate, however, that age is only partly responsible for the relative position of the Medical Corps.

The importance of agility and speed in the tests is generally overestimated by the subject of examination. It would seem reasonable to suppose that medical officers on account of their greater age would be placed at a disadvantage by comparison with other officers because of the limited time allowed to work on each test. If this were actually the case those tests which are most closely timed, and therefore most nearly speed tests, rather than achievement tests, should show relatively the lowest scores for medical officers. This is not the case. Comparison of the numbers of officers who complete a test within the time limit shows that the allowance is relatively liberal for tests 1, 5, 7 and 8, whereas for tests 2, 3, 4 and 6 the time allowance is so short that only a small proportion of officers can finish.

The medical psychograph of figure 2 indicates that of the four

¹ Official report, table 369, p. 816.

liberally timed tests, number 1 and number 7 are the most difficult, and number 8 one of the easiest for medical officers. Test 5 also is relatively easy. Of the speed tests, numbers 2 and 6 are relatively difficult, whereas test 4 ranks with test 8 as one of the easiest of all. Test 3 also is relatively easy. It is evident, then, that a short time allowance is not a factor which renders the tests of examination alpha more difficult for medical officers than for other army officers.

There is no evidence whatever that medical officers worked more carefully and accurately than other officers and as a result failed to achieve as high scores as those officers who worked more rapidly. In general it has been found that speed and accuracy in tests of intelligence are highly correlated. It is therefore wholly improbable that the relative rank of the Medical Corps is affected to any considerable extent by professional training and experience.

Evidence is lacking also for differences in applicability of the tests to special army groups. Examination of the preceding tables and curves shows that the examination as a whole is fair to very diverse individuals and groups because of the variety of elements combined in it. In this connection careful study of table 7 and figure 2 is desirable. If the examination in question had depended upon the exercise of a single type of intellectual function the possibility of unfairness would be obvious. Instead it depends upon the exercise of all of the principal intellectual functions and employs those functions in various combinations for response to a large number of test items in each of eight markedly different types of test.

The method of selection for military appointment in the Medical Department differed radically from that of other arms of the service. For the Medical Corps, as well as the Dental, Veterinary and Sanitary Corps, applications were received from qualified civilians and acted on either favorably or unfavorably according to physical condition, age and professional qualifications. Aside from the physical examination, and in certain instances a professional examination of candidates for the Medical Corps, no special tests were given to measure the ability or professional competence of the individual, and though many of the candidates were sent to officers' training schools for rapid or intensive training, this was done in the Medical Department after military appointment instead of before. In the case of the other arms of the ser-

vice a large proportion of candidates for appointment were sent to officers' training schools prior to appointment and were there subjected to a series of examinations, the effect of which was to eliminate the less intelligent as well as those otherwise less competent for military service. Data of psychological examinations show a high correlation between intelligence and success in achieving military appointment in officers' training schools. There can be no doubt that the method of selection employed by the Medical Department of the army worked to the disadvantage of the medical profession so far as intellectual status is concerned. Had the exigencies of the situation permitted the Medical Department to utilize a probational period as did the other corps, the intelligence of its personnel would have been much higher.¹

It is reasonably certain, then, that age and method of military selection are largely responsible for the relatively low intelligence of medical officers. The Medical Department obtained the services alike of the best and the poorest members of the profession, but the proportion of intellectually inferior and professionally incompetent men was much larger in this group, for the reason indicated above, than in many other arms of the service. These explanations of the status of medical officers must not be taken as a justification of that status. It is wholly clear that the medical profession has a large number of men who are intellectually incompetent and who should not have been allowed to study medicine, or having studied it, should not have been licensed as practitioners. The army was constrained to accept their services because of an imperative need of medical officers. Ordinarily their applications would have received scant consideration.

To the credit of the Medical Department of the army is the fact that rank is more highly correlated with intelligence in the case of medical officers than for any other military group. The intellectually low grade men of the medical profession are almost invariably of low military rank, and promotion depends alike upon intellectual ability and professional value.

Education of Medical Officers

The schooling reported on the psychological examination record

¹ At Camp Greenleaf, the medical officers' training camp, beginning early in 1918, a professional examination and also the army psychological examination were utilized to eliminate the incompetent. Doubtful cases were re-examined after a period of intensive training. This definitely indicates that the Medical Department appreciated the desirability of rigorous examinations in association with a probational period.

by all officers yields a median of 14.7 years. If 8 years be allowed for grammar school and 4 years for high school, this median represents 2.7 years of college or professional training. Put in another way, the average army officer was nearly through the third year in college, technical or professional school, when his formal education ended. The group of medical officers reported a median schooling of 15.8 years, which is equivalent to 3.8 years beyond high school. As a rule these years were devoted to professional instead of collegiate or pre-medical study.

The principal available facts concerning the schooling of the chief arms of the service appear in table 12, which gives the distribution for several arms of the service and also for three rank-groups in the Medical Corps, as well as the medians for each. According to this table the medical group has the most schooling, the Quartermaster Corps the least schooling, of the several arms of the service compared. Yet their performances on examination alpha are practically identical. Between medical officer and engineer officer there is one-half year difference in favor of the former.

For the special medical group which has been intensively studied, data concerning education, both pre-medical and medical, are assembled in table 13. It is evident from the figures that the pre-medical education ordinarily does not exceed high school training, and that the professional training adds nearly four years to the total.

Figure 5 visualizes the distribution of schooling in case of recruits, Quartermaster, Engineer and Medical Corps.

The relation of intelligence to date of education, as indicated by table 14, is worthy of consideration. The median intelligence increases with approach to the present. This is in part due to age of the individuals, since the earlier graduates would show somewhat lower scores than the later graduates, but it is also due in part to the abandonment of several poor medical schools following the publication of Flexner's¹ report on the status of medical education in the United States, and the increase in educational requirement for entrance to medical schools.

Professional Experience of Medical Officers

The professional experience of this group of 2500 medical officers, previous to military appointment, is recorded statistically in table

¹ Abraham Flexner, "Medical Education in the United States and Canada." New York, Carnegie Foundation for the Advancement of Teaching, 1910.

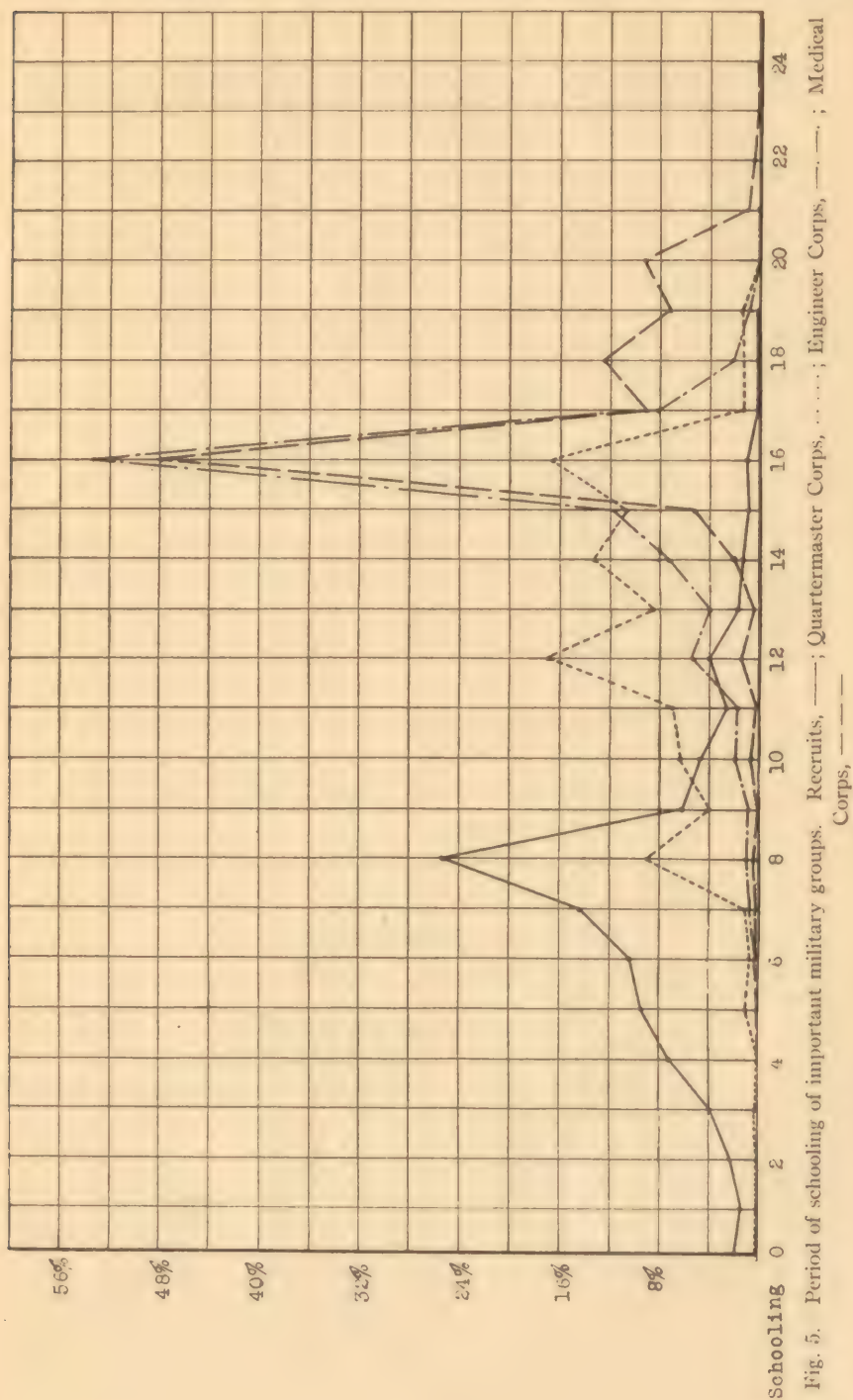


Fig. 5. Period of schooling of important military groups. Recruits, —; Quartermaster Corps, ···; Engineer Corps, ---; Medical Corps, - - -

TABLE 12

Length of schooling reported by officers in different arms of the service and by different ranks in the medical corps

Yrs. schooling	In- fantry	Ar- tillery	Engi- neer	Quarter- master	Medi- cal	Dental	Veteri- nary	Total	Medical		
									1st Lts.	Cap- tains	Major and above
25.....	....	....	....	....	1	....	....	1	....	1	....
24.....	1	....	....	....	2	....	....	3	2	....	....
23.....	....	....	....	....	3	....	....	3	3	....	....
22.....	2	....	....	....	13	....	....	16	6	7	....
21.....	1	1	....	....	27	....	....	34	16	10	1
20.....	6	2	1	....	242	....	1	260	149	79	14
19.....	90	22	4	8	187	6	2	337	107	67	13
18.....	132	40	10	8	318	9	12	554	197	111	10
17.....	177	60	37	8	234	21	12	592	150	77	7
16.....	1486	470	238	100	1230	113	43	3894	799	366	65
15.....	778	181	53	64	136	159	140	1604	62	67	7
14.....	809	154	33	80	57	8	....	1247	27	26	4
13.....	487	79	18	51	12	2	....	1700	11	....	1
12.....	854	124	24	102	41	9	....	1246	26	13	2
11.....	337	29	8	42	8	3	....	460	2	6	....
10.....	328	35	9	38	20	2	11	485	4	16	....
9.....	228	18	4	24	1	1	3	318	1	....	....
8.....	305	16	5	54	13	....	5	443	7	5	1
7.....	39	4	3	7	6	....	....	64	3	3	....
6.....	37	4	1	4	4	....	....	51	3	1	....
5.....	18	3	....	6	3	....	....	31	3	....	....
4.....	16	2	....	....	1	....	....	22	....	....	1
3.....	14	4	....	1	....	....	....	20	....	....	....
2.....	5	1	....	....	....	....	....	6	....	....	....
1.....	1	....	....	....	....	....	....	1	....	....	....
0.....	3	....	....	1	....	....	....	4	....	....	....
Total.....	6154	1255	448	598	2559	334	229	12396	1576	857	126
Median....	13.5	14.8	15.3	12.4	15.8	14.9	14.7	14.7	15.8	15.8	15.7

15. The largest single group had from 10 to 14 years' experience, while the median period is slightly in excess of 11 years.

In this respect the Medical Corps is unique, for no other arm of the service, not excepting the Engineer, Dental and Veterinary, has half the professional experience of this group. It is undoubtedly true that this marked difference in length of professional experience, coupled with age, affects not only the intelligence score of the medical officer, but also the character of his psychograph.

TABLE 13

Distribution of length of pre-medical and of total education
of medical officers

Years	Pre-medical education		Total education	
	Number	Percentage	Number	Percentage
24	...	.....	2	0.09
23	...	.....	1	0.04
22	...	.....	4	0.2
21	...	.....	36	1.5
20	...	.....	293	12.5
19	1	0.04	250	10.7
18	7	0.3	308	13.1
17	32	1.3	310	13.2
16	485	20.5	744	31.6
15	148	6.2	288	10.6
14	267	11.2	111	4.7
13	295	12.4	32	1.4
12	826	34.8	12	0.5
11	199	8.4	5	0.2
10	92	3.9	...	.....
9	20	0.8	...	.....
8	2	0.1	...	.....
Not given	133	.....	152	.....
No. cases	2507	.....	2507	.....
Median.....	12.16	.....	16.07	.....

Geographical Facts and Relations

The medical officers under consideration were drawn from all parts of the United States, but not in proportion to the number of practitioners in different localities. Instead, the records used for this report come largely from camps in which medical officers were most frequently examined. It happens, however, that every state in the union except Wyoming is represented in the group. The states most numerous represented are New York, Illinois, Ohio and Pennsylvania. Those least represented are Nevada, New Mexico and Delaware. Because of the small representation of certain states it was necessary to group the states for statistical purposes as indicated in table 16.

Locational intelligence.—For these several sections of the country interesting and valid differences in intelligence, experience, earn-

TABLE 14

Alpha distributions of groups graduated in different years

Alpha score	1880-85	1886-90	1891-95	1896-1900	1901-05	1906-10	1911-15	1916-18	Years not known and non-graduates	Total
205-212	..	..	..	..	..	..	..	..	..	..
200-204	..	..	..	1	1	..	..	1	..	3
190-199	..	..	3	1	7	1	7	3	..	22
180-189	1	1	2	10	19	21	15	7	..	76
170-179	..	1	4	19	16	25	39	27	..	131
160-169	..	3	7	25	39	48	45	27	1	195
150-159	..	7	19	29	57	51	56	29	2	250
140-149	4	8	15	35	60	56	53	35	1	267
130-139	3	7	19	33	57	57	77	34	..	287
120-129	..	8	18	40	54	68	62	25	1	276
110-119	..	3	19	37	63	63	68	31	1	285
100-109	..	9	16	30	45	63	50	13	1	227
90-99	1	3	9	26	38	39	43	12	1	172
80-89	1	2	12	28	31	21	19	7	..	121
70-79	..	3	9	11	18	17	14	3	1	76
60-69	..	4	3	8	12	16	8	1	1	53
50-59	..	..	5	6	14	6	6	..	..	37
40-49	1	1	4	4	1	5	2	1	..	19
30-39	..	..	1	..	2	1	2	..	1	7
20-29	..	..	..	..	1	..	1	..	..	2
10-19	..	..	1	..	..	..	..	..	..	1
Total	11	60	166	343	535	558	567	256	11	2507
Median	138.75	126.25	121.3	124.8	127.9	127.1	131.0	140.3	117.5	129.2

TABLE 15

Distribution of experience of 2392 medical officers

Years' experience	Number	Percentage
25 years and over	137	5.7
20-24	237	9.9
15-19	399	16.7
10-14	538	22.5
7-9	321	13.4
4-6	325	13.6
1-3	302	12.6
0	133	5.6
Total ¹	2392	.....
Median.....	11.07 years	.....

¹ Experience was not indicated by 115 of the 2507 medical officers.

TABLE 16

States included in each section, with number of cases

State	No. cases			State	No. cases		
	Residence	Certificate	College		Residence	Certificate	College
NORTHEAST				SOUTH CENTRAL			
Maine.....	17	15	9	North Carolina.....	19	20	6
New Hampshire.....	14	10	14	South Carolina.....	14	16	9
Vermont.....	8	16	29	Kentucky.....	67	77	133
Massachusetts.....	138	152	124	Tennessee.....	52	62	129
Rhode Island.....	10	9	0				
Connecticut.....	22	15	9	Total.....	152	175	277
New York.....	276	257	272				
Total.....	485	474	457	NORTH CENTRAL			
ATLANTIC				Ohio.....	194	190	191
New Jersey.....	50	30	0	Michigan.....	65	69	75
Pennsylvania.....	193	183	253	Minnesota.....	64	51	44
Delaware.....	3	5	0	Wisconsin.....	61	56	29
Maryland.....	28	34	147	North Dakota.....	9	10	0
Virginia.....	20	30	42	South Dakota.....	14	13	0
West Virginia.....	30	19	0				
District of Columbia..	11	6	23	Total.....	407	389	339
Total.....	335	307	465	CENTRAL			
SOUTHERN				Indiana.....	109	100	58
Georgia.....	47	48	52	Illinois.....	220	278	393
Florida.....	15	11	0	Iowa.....	86	88	56
Alabama.....	37	41	21	Missouri.....	115	114	146
Mississippi.....	46	45	21	Kansas.....	42	36	50
Louisiana.....	29	32	51	Nebraska.....	44	45	43
Arkansas.....	3	22	6				
Oklahoma.....	33	16	4	Total.....	616	661	746
Texas.....	57	48	19	WESTERN			
New Mexico.....	7	4	0	Oregon.....	37	31	16
Total.....	274	267	154	Washington.....	47	25	0
				Montana.....	21	15	0
				Idaho.....	8	7	0
				Wyoming.....	0	0	0
				California.....	85	50	43
				Nevada.....	0	1	0
				Utah.....	9	7	0
				Arizona.....	21	0	0
				Colorado.....	24	16	10
				Total.....	252	152	69

ings and degree of specialization appear. The outstanding differences are those in intelligence as measured by examination alpha. These are indicated by the median scores and grades of table 17

TABLE 17

Median alpha scores of doctors from different sections of the country

Section	Residence			Certificate			Graduation		
	No. cases ¹	Score	Grade	No. cases	Score	Grade	No. cases	Score	Grade
Northeast.....	485	138.8	A	474	138.1	A	457	139.9	A
Atlantic.....	335	126.1	B	307	124.7	B	465	129.9	B
South Central.....	152	102.3	C+	175	104.4	C+	277	105.6	B
Southern.....	274	115.2	B	267	116.8	B	154	117.6	B
North Central.....	407	135.1	A	389	135.3	A	339	131.3	B
Central.....	616	126.0	B	661	127.4	B	746	129.3	B
Western.....	252	140.0	A	152	137.7	A	69	139.6	A
Total.....	2521	129.2	B	2419	128.9	B	2507	129.2	B

and by the detailed distribution of table 18. They are also visualized in part by figure 6.

The median scores for the seven sections of the country range from 102 points in the South central, including North and South Carolina, Kentucky and Tennessee, to 139 and 140, respectively, in the Northeast and the Pacific and Rocky Mountain states. The Atlantic central states stand higher than the Southern but lower than the North central. Corresponding groupings were made on the basis of the state from which the individual is certified and also in which he was graduated. These groupings yield results very similar to the above.

The data of the tables tend to confirm Cattell's study of the distribution of professional ability ("American Men of Science"), in which he demonstrated that New England and California were supplying eminent men of science in larger proportion than were other regions. The groups of medical officers from the Northeast and the Pacific coast are nearly identical in intelligence and similar in other respects as indicated by the several tables of this section.

¹ For number of cases from individual states, see table 16.

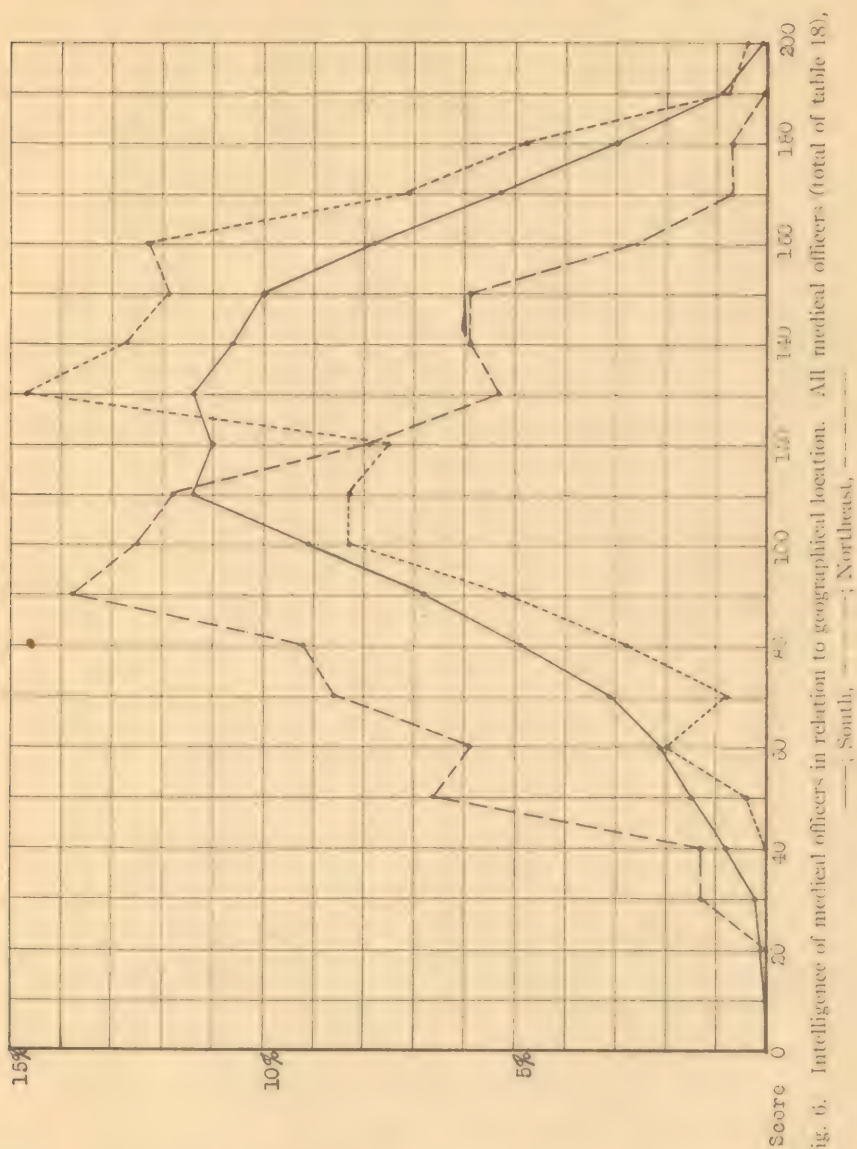


Fig. 6.

Population and intelligence.—In order to study relation of other facts to population of the community in which medical officers had practiced, communities with population of less than 2500 are classified as rural; 2500 to 249,999 as urban; 250,000 or more as metropolitan. For these three types of community the distribution of intelligence scores is given in table 19. There is a tendency for

TABLE 18

Distribution of alpha scores of doctors practicing in different parts of the country

Alpha score	North-east	Atlantic	South central	South	North central	Central	Western	Total
200-204	2	..	..	..	..	..	1	3
190-199	7	6	..	..	4	4	2	23
180-189	24	10	1	3	12	14	12	76
170-179	43	15	1	7	27	20	18	131
160-169	50	25	4	16	30	42	31	198
150-159	48	34	9	18	51	60	30	250
140-149	59	27	9	22	48	71	32	268
130-139	61	35	8	24	60	65	37	290
120-129	48	44	12	27	34	93	19	277
110-119	57	44	18	35	48	62	21	285
100-109	33	35	19	34	32	54	21	228
90-99	15	27	21	23	22	53	13	174
80-89	18	10	14	22	21	29	7	121
70-79	11	7	13	16	8	20	2	77
60-69	5	5	9	8	5	16	5	53
50-59	3	8	10	7	2	6	1	37
40-49	1	2	2	6	2	6	..	19
30-39	..	..	2	5	..	1	..	8
20-29	..	1	..	1	..	..	..	2
15-19	..	..	..	..	1	..	..	1
Total....	485	335	152	274	407	616	252	2521
Median...	138.8	126.1	102.3	115.2	135.1	126.0	140.0	129.2

the more intelligent medical men to practice in the larger communities. Although the differences in median scores are not great, they undoubtedly indicate that the less intelligent physician can more readily gain a practice in the less populous community.

Earnings of Medical Officers

Medical officers report annual earnings over a wide range. The highest amount reported is \$75,000. The lowest, except for internes or those beginning practice, is \$500. The distribution of earnings for the 1536 medical officers who reported this item is given in table 20, which indicates also median earnings of \$4,318.40. Certain of the important factors influencing professional earnings are briefly considered below.

Earnings and location.—The earnings of the medical profession

TABLE 19

Distribution of alpha scores of doctors practicing in rural, urban and metropolitan communities

Alpha score	Rural under 2500	Urban 2500 to 249,999	Metropolitan ¹ 250,000 and over	Total
205-212	.....	.....	.....	.....
200-204	0.15	0.2	.....	0.1
190-199	0.75	0.7	1.4	0.9
180-189	2.4	2.8	4.2	3.1
170-179	1.95	5.2	8.0	5.1
160-169	6.0	8.1	9.6	8.0
150-159	9.15	10.2	10.6	10.0
140-149	9.6	11.1	10.7	10.6
130-139	10.5	10.8	13.3	11.4
120-129	12.6	10.7	9.8	11.0
110-119	11.25	11.9	10.2	11.3
100-109	9.3	9.2	8.7	9.1
90-99	8.55	6.4	6.2	6.9
80-89	6.45	5.4	2.6	4.9
70-79	4.35	3.0	1.7	3.1
60-69	3.0	2.0	1.7	2.2
50-59	2.25	1.3	0.8	1.4
40-49	0.75	0.8	0.2	0.6
30-39	0.9	.....	0.1	0.2
20-29	.....	0.1	0.1	0.1
10-19	.....	0.1	.....	.....
Total.....	666	1071	723	2460
Median.....	122.6	129	136.3	129.3

differ for sections of the country as shown by tables 21 and 22. These differences are similar to those for intelligence, despite the fact that the more intelligent officers do not earn most.

Earnings and population.—Tables 23 and 24 contain significant data on the relation of earnings to population of the community. The coefficient of correlation is +0.19. This figure is many times greater than its probable error and may be taken to indicate that density of population has a definite and positive relation to a physician's earnings.

Earnings and intelligence.—Surprising as it may appear, earnings

¹ Includes the following cities: Baltimore, Boston, Brooklyn, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Indianapolis, Kansas City, Los Angeles, Milwaukee, Minneapolis, New Orleans, New York, Newark, N. J., Philadelphia, Pittsburgh, Portland, Ore., Rochester, St. Louis, San Francisco, Seattle.

TABLE 20
Distribution of earnings of 1536 medical officers

Annual earnings	Number of cases	Percentage
\$30,000 and over	8	0.5
25,000	4	0.3
20,000	9	0.6
18,000	7	0.5
16,000	5	0.3
14,000	22	1.4
12,000	36	2.3
10,000	75	4.9
9,000	30	2.0
8,000	64	4.2
7,000	59	3.8
6,000	142	9.2
5,000 ^v	170	11.1
4,000	201	13.1
3,000	297	19.3
2,500	119	7.7
2,000	155	10.1
1,500	66	4.3
1,000	49	3.2
500-999	18	1.2
Total ¹	1536	....
Median.....	\$4,318.40	....

TABLE 21
Median annual earnings of doctors from different sections of the country

Section	Residence		Certificate		College	
	No. cases	Median earnings	No. cases	Median earnings	No. cases	Median earnings
Northeast....	274	\$4781	274	\$4742	457	\$4667
Atlantic.....	206	4774	204	4834	465	4930
South central	105	3184	121	3239	277	3525
Southern.....	185	3803	169	3838	154	3367
North central	249	4411	239	4339	339	4310
Central.....	355	4226	385	4385	746	4675
Western.....	160	5000	113	4967	69	4214
Total.....	1534	\$4332	1505	\$4338	1536	\$4318

¹ Earnings were not given by 971 (38.8%) of the 2507 medical officers.

TABLE 22

Distribution of earnings of doctors practicing in different parts of the country

Annual earnings	Northeast	Atlantic	South central	Southern	North central	Central	Western	Totals
\$30,000 and over	1	..	..	..	3	1	2	7
25,000	2	..	..	..	..	1	1	4
20,000	1	1	..	..	2	2	3	9
18,000	1	..	..	..	3	1	2	7
16,000	1	..	..	..	3	1	..	5
14,000	6	7	..	1	3	2	3	22
12,000	11	5	..	2	6	6	6	36
10,000	16	11	3	4	11	16	14	75
9,000	7	5	1	2	4	6	6	31
8,000	11	9	..	5	13	20	6	64
7,000	6	13	2	6	9	19	5	60
6,000	32	15	2	16	26	30	21	142
5,000	35	30	9	19	25	40	11	169
4,000	32	31	20	30	28	42	22	205
3,000	43	34	19	38	58	83	23	298
2,500	23	18	16	14	18	15	10	114
2,000	19	17	23	26	15	43	14	157
1,500	10	5	4	16	8	16	7	66
1,000	14	5	6	4	11	4	4	48
500-999	3	..	..	2	3	7	..	15
Total...	274	206	105	185	249	355	160	1534
Median earnings	\$4781	\$4774	\$3184	\$3803	\$4411	\$4226	\$5000	\$4337
Median experience	11.21	11.20	7.26	12.79	11.70	10.85	10.15	11.07

in the medical profession apparently are not dependent upon intelligence. The correlation between earnings and alpha scores (see table 25) is $+0.06$. On the possibility that this result might be misleading, the relationship was still further studied. It was thought that experience, because of its predominating influence, might obscure the importance of intelligence. The correlation was therefore computed for a closer experience-group of from 10 to 14 years. For this group earnings correlated with intelligence to the extent of $+0.08$. Since even this group had included an

TABLE 23

Differences in alpha score and in earnings between doctors practicing in rural, urban and metropolitan communities

Community	Alpha score		Earnings	
	No. cases	Median	No. cases	Median
Rural.....	666	122.6	448	\$3606
Urban.....	1071	129.0	681	4994
Metropolitan ¹	723	136.3	378	4646
Total.....	2460	129.3	1507	\$4380

TABLE 24

Correlation between earnings and size of town

Earnings	POPULATION								
	999	1,000	2,500	10,000	50,000	250,000	500,000	1,000,000	Total
\$25,000 and over	..	..	..	2	4	2	..	3	11
18,000	..	..	2	4	3	4	1	2	16
14,000	..	1	2	9	7	4	3	1	27
12,000	2	1	3	10	7	4	2	7	36
10,000	5	4	13	18	9	7	7	12	75
8,000	4	9	19	18	16	8	12	8	94
6,000	17	28	36	38	39	19	12	12	201
4,000	67	45	66	54	49	37	25	28	371
3,000	69	35	29	57	34	29	19	22	294
2,500	22	16	13	12	17	16	5	7	108
2,000	53	25	17	14	16	10	9	8	152
1,500	20	2	9	8	7	3	2	8	59
1,000	14	5	3	8	3	5	5	5	48
500-999	4	..	3	2	1	3	1	1	15
Total.....	277	171	215	254	212	151	103	124	1507

$r = +0.19$

extreme difference in experience of 5 years, further selection was made and the correlation between earnings and intelligence was computed for 88 medical officers who reported 12 years' experience. The result was $+0.07$. These correlations are too low to be significant practically, if not statistically.

¹ For list of cities included see table 19.

Earnings, experience and military rank.—The physician's earning capacity, according to the statistical data for the group of medical officers, is closely related to the length of his practical experience. This appears from the medians of table 26. There is a steady increase in median earnings up to 20 years' experience and there-

TABLE 25
Correlation between earnings and alpha score

Alpha score	Earnings														Total
	\$500 and under	1,000	1,500	2,000	2,500	3,000	4,000	6,000	8,000	10,000	12,000	14,000	18,000	25,000 and over	
200-212							2								2
190-199				3	1	3	6	1							14
180-189			3	3	1	9	12	9	2	4	1	2	1	1	48
170-179	1	5		1	8	13	20	9	2	1	2	3	1		69
160-169		1	3	10	6	23	23	18	4	7	4	4	1	1	108
150-159	1	6	10	12	14	30	37	30	7	6	2	2	3	2	162
140-149	1	1	5	21	10	28	26	23	11	7	3	1	1	3	144
130-139	2	6	7	14	13	37	40	20	10	7	3	5	2	1	167
120-129		3	7	14	6	30	41	24	15	9	4	2	1	1	163
110-119	3	4	7	15	17	31	43	23	9	8	5	3	1		169
100-109	1	5	9	14	11	34	36	12	13	8	2	4	2	1	152
90-99	1	5	5	12	7	16	27	13	11	4	2		1	1	105
80-89	2	1	1	15	8	12	21	6	4	5	4	1			80
70-79		2	5	10	4	6	15	3	3	4	2		1		55
60-69		2		5	3	4	11	6	2	4	1		1		39
50-59	1		2	3	3	6	8	4	1	1	1				30
40-49	1		1	1	1	5	5	1	1						16
30-39		1			1	4									6
20-29				1											1
10-19	1														1
Total...	15	48	65	157	114	297	373	202	95	75	36	27	16	11	1531
$r = +0.06$															

after a decrease, according to the data of this table. This result may be due to selectional processes operating in the Medical Department, for ordinarily physicians with more than 25 years' experience would not be accepted for service.

The correlation between earnings and experience as computed from table 27 is $+0.25$. This is not a high correlation but it indicates the closest relationship which has been found between earnings and any other variable.

TABLE 26

Median earnings of groups reporting different length of experience

Years' experience	No. cases	Median earnings
1-3	147	\$2529
4-6	206	3686
7-9	232	4594
10-14	394	4914
15-19	277	4956
20-24	177	4938
25 and over	98	4625
Total.....	1531	\$4339

Earnings are importantly related to the military rank an officer received, as appears from table 28. Or differently viewed, the rank of medical officers varies directly with experience, as does also their annual earning capacity in civil practice.

TABLE 27

Correlation between earnings and experience

Earnings	Years of experience							Total
	1-3	4-6	7-9	10-14	15-19	20-24	25 and above	
\$25,000 and over	..	..	2	3	1	2	3	11
18,000	..	1	2	4	2	4	3	16
14,000	..	..	3	8	9	7	..	27
12,000	..	1	5	14	8	6	2	36
10 000	2	10	10	22	15	9	7	75
8,000	1	10	14	28	21	9	11	94
6,000	3	23	39	63	35	32	7	202
4,000	14	42	60	108	82	42	26	374
3,000	29	51	46	69	49	35	18	297
2,500	26	18	11	21	23	12	3	114
2,000	29	26	24	34	24	13	7	157
1,500	17	17	7	12	3	4	5	65
1,000	19	5	7	6	5	1	5	48
500-999	7	2	2	2	..	1	1	15
Total.....	147	206	232	394	277	177	98	1531

$r = + 0.25$

Earnings and specialty.—Another factor which has definite relationship to the annual earnings of the medical officer is his specialty. It has been found, for instance, that those reporting themselves as surgeons earn \$5,666, whereas those listed as specialists in mental and nervous diseases report earnings of \$3,312. These facts appear in table 29 along with data for certain other

TABLE 28
Earnings and military rank

Earnings	Lieutenants	Captains	Majors and above	Total
\$30,000 and over		5	3	8
25,000	2	1	1	4
20,000	2	5	2	9
18,000		6	1	7
16,000	1	4	..	5
14,000	6	11	5	22
12,000	14	18	4	36
10,000	32	37	6	75
9,000	9	19	2	30
8,000	27	34	2	63
7,000	28	28	3	59
6,000	76	61	6	143
5,000	92	72	6	170
4,000	121	65	15	201
3,000	199	86	10	295
2,500	90	28	2	120
2,000	120	35	1	156
1,500	54	10	2	66
1,000	40	9	..	49
500-999	15	3	..	18
Not given.....	573	326	72	971
Total.....	1501	863	143	2507
Median.....	\$3728	\$5451	\$5916	\$4318
Median, years' experience.....	7.71	15.76	17.67	11.07

important special groups. For ready comparison the median alpha scores also are inserted. Internal medicine provides next to the highest intelligence score, 142.5 points, whereas surgery with a median score of 126.8 points reports larger earnings. This is probably due on the one hand to the inclusion in the surgical group of a number of practitioners whose earnings are exceptionally

large, and on the other hand to the fact that the Medical Department undoubtedly utilized the services of a considerable number of surgeons of low grade intelligence.

To sum up this account of the relations of earnings, it would seem that length of experience, field of specialization, population of the community and geographical location are importantly related to earning capacity. On the other hand, earning capacity appears

TABLE 29

Earnings and intelligence of specialists in different fields

Specialty	Earnings		Alpha scores	
	No. cases	Median	No. cases	Median
Surgery.....	395	\$5666	571	126.8
Internal medicine.....	102	5481	159	142.5
Eye, ear, nose and throat.....	139	5182	205	128.3
Gynecology and obstetrics.....	61	4622	78	127.5
Genito-urinary, urology.....	49	3812	59	131.5
General practice.....	463	3782	999	125.2
Roentgenology, X-ray, Radiography...	35	3750	45	132.5
Not given.....	143	3342		
Mental and nervous.....	35	3312	50	143.0
Total.....	1536	\$4318	2507	129.2

to be practically independent of intelligence as measured by army examination alpha.

Military Relations and Specialty of Medical Officers

Military appointment and intelligence.—Several interesting aspects of the relation of doctors to the military machine may be seen through these data. By far the larger part of the group had been commissioned in the Medical Officers Reserve Corps. There were included, however, a small group of officers of the National Guard and another of the Regular Army. These two small groups made a much better showing on examination alpha than did the larger group from the Medical Officers Reserve Corps. The medical officers of the Regular Army, in fact, did as well as officers of any branch of the army except the engineers. The small size of the group, however, makes the reliability of the median un-

certain. The median score is 14.3 for the National Guard and Regular Army combined, as compared with 128.6 for the Medical Reserve Corps.

Military assignment, specialty and promotion.—The specialties reported by our group of medical officers appear in table 30. There was, of course, some attempt to recognize civilian specialization in military assignment. The available data concerning civilian specialization and assignment to special work in the Medical Department have been assembled in table 31, which shows the number of cases in which assignment was to the specialist's own field, the number in which it was different, and the number in which no record appears.

TABLE 30
Specialties reported

Specialty	No. of cases	Percentage
Anesthesia.....	37	1.6
Eye.....	46	2.0
Eye, ear, nose and throat.....	193	8.5
Genito-urinary.....	77	3.4
Gynecology and obstetrics.....	88	3.9
Internal medicine.....	178	7.8
Mental and nervous diseases.....	54	2.4
Roentgenology.....	52	2.3
Surgery.....	640	28.2
General practice.....	683	30.0
Miscellaneous.....	224	9.9
Total, specialty given ¹	2272	.....

Similarly table 32 shows the number and percentage of promotions on record for each division of the Medical Department and for each specialty. Promotions were more frequent in some divisions than in others. They do not appear, however, to have been more frequent for medical officers who were assigned to their own specialty than for others. The high frequency of promotion in the group whose assignment is unknown is unexplained.

Military rank and its relations.—The rank of the medical officer, and especially the rank to which he was commissioned from ci-

¹ Of the 2507 medical officers, 235 failed to indicate either specialty or general practice.

TABLE 32
Relation of promotion in the army to assignment and specialty (percentages)

Specialty	Military assignment													Assignment different	Assignment not known	Percentage of total promoted	Number of promotions
	Laboratory division	Permanent staff	Sanitation	Eye, ear, nose and throat	Genito-urinary diseases	Internal medicine	Mental and nervous diseases	Orthopedics	Röntgenology	Surgery	Tuberculosis	Veneral diseases	General service	Field service	Reconstruction, Division of Hospitals and Aviation		
Anesthesia.....	..	..	..	0	..	0	..	..	..	0	..	..	0	0	0	75	3
Gynecology and obstetrics.....	..	..	0	..	..	0	..	..	..	12	..	0	0	0	0	21	10
Eye.....	..	..	..	10	..	0	..	..	100	..	..	..	0	0	100	42	8
Eye, ear, nose and throat.....	..	0	25	19	..	0	..	0	..	0	0	..	0	0	100	7	17
Genito-urinary diseases.....	0	..	..	..	13	0	..	..	..	0	0	100	0	0	100	6	38
Internal medicine.....	100	67	100	100	..	15	..	0	..	0	50	..	0	0	..	45	15
Mental and nervous diseases.....	..	..	..	..	0	0	21	..	..	..	..	..	0	0	0	20	46
Orthopedics.....	..	..	25	..	0	0	..	23	..	..	..	..	0	0	0	50	17
Röntgenology.....	..	100	..	..	..	..	..	..	17	20	..	..	0	0	..	100	14
Surgery.....	..	75	38	..	0	36	..	20	17	13	..	..	0	7	0	33	125
Tuberculosis.....	..	100	..	..	..	40	..	..	..	..	11	..	0	0	100	40	10
Veneral diseases.....	0	..	..	..	0	..	..	..	..	..	..	0	0	0	..	0	0
General practice.....	0	100	35	33	0	15	0	0	0	12	100	0	0.6	0	31	52	157
Miscellaneous.....	17	33	33	..	13	..	..	0	0	33	0	..	0	0	50	46	39
Not known.....	33	0	50	40	50	25	0	0	0	46	..	..	0	..	50	39	80
Percentage of total, promoted.....	19	52	38	19	12	17	19	15	16	14	33	20	0.5	2	39	46	...
Number of promotions.....	7	11	18	28	6	44	4	7	7	60	6	1	2	4	12	345	562

vilian life, depended primarily on age, length of experience and earnings in civil life.

Table 33 presents the median values by rank of medical officers, for intelligence, experience, schooling and earnings.

TABLE 33

Rank of medical officers and intelligence, experience,
schooling and earnings

Median values	Lieutenant	Captain	Major and above	All medical officers
Intelligence.....	128	134	149	129.2
Experience.....	7.71	15.76	17.67	11.07
Schooling.....	15.80	15.80	15.73	15.8
Earnings.....	\$3728	\$5451	\$5916	\$4318

TABLE 34

Distribution of alpha scores of medical officers
of different ranks

Alpha score	Lieutenant	Captain	Major and above	Total
200-204	1	2		3
190-199	12	7	3	22
180-189	34	32	11	77
170-179	72	46	13	131
160-169	114	62	19	195
150-159	146	86	19	251
140-149	151	94	21	266
130-139	170	98	19	287
120-129	165	100	11	276
110-119	184	91	10	285
100-109	144	75	7	226
90-99	113	53	7	173
80-89	73	46	1	120
70-79	45	30	1	76
60-69	33	19	1	53
50-59	24	13		37
40-49	13	6		19
30-39	6	1		7
20-29	1	1		2
15-19		1		1
Total.....	1501	863	143	2507
Median.....	128	134	149	129.2

Membership of Medical Officers in Medical Societies

In the group of officers studied, 1964 individuals reported membership in medical societies of the United States. The number of societies reported ranges from 1 to 7. Over 25% of those reporting held membership in three medical societies. Over 50% report membership in one or two societies. Membership in no medical society was reported by 237 officers. Of the 1964 officers reporting membership in medical societies, 50.7% were members of the American Medical Association. The median intelligence score of those reporting themselves as members of the American Medical Association is 128.2; that of non-members, 129.8.

DATA CONCERNING MEDICAL SCHOOLS

Over 130 medical schools are represented by this group of 2507 medical officers. The number of men from a single school was, in most cases, small, the largest number being 118 from Rush Medical College. Only 18 schools were represented by as many as 35 individuals. Statistics for these 18 schools are given later. In general, it was necessary, if reliable figures were to be obtained, to consider schools by groups. They were grouped first according to location. The geographical groups thus obtained yielded information which confirms geographical data already presented. The schools were next grouped by size. Certain statements may be made concerning the large schools as compared with those which have few students. They were then grouped according to entrance requirements. Groupings were also made according to the rating of the school by the American Medical Association, and according to the medical sect followed. The groupings obtained on these different bases have been compared as to score in intelligence examination alpha, income reported and length of experience.

Geographical Classification

The geographical grouping of states is that previously used for grouping medical officers (table 16).

Geographical Grouping of Medical Schools

NORTHEAST:

- University and Bellevue Hospital Medical College.
- Boston University School of Medicine.
- Bowdoin Medical School.
- University of Buffalo Department of Medicine.
- College of Physicians and Surgeons, Boston.

Columbia University College of Physicians and Surgeons.
 Cornell University Medical College.
 Dartmouth Medical School.
 Fordham University School of Medicine.
 Medical School of Harvard University.
 Long Island College Hospital.
 New York Homeopathic Medical College and Flower Hospital.
 Eclectic Medical College of the City of New York.
 Syracuse University, College of Medicine.
 Tufts College Medical School.
 Union University.
 University of Vermont College of Medicine.
 Yale University School of Medicine.

ATLANTIC:

Baltimore University School of Medicine.
 Hahnemann Medical College and Hospital of Philadelphia.
 Jefferson Medical College of Philadelphia.
 Johns Hopkins University Medical Department.
 Maryland Medical College.
 University of Maryland School of Medicine and the College of Physicians and Surgeons.
 Medico-Chirurgical College of Philadelphia.
 University of Pennsylvania School of Medicine.
 University of Pittsburgh School of Medicine.
 Temple University Department of Medicine.
 Medical College of Virginia.
 University of Virginia Department of Medicine.

SOUTH CENTRAL:

University of Chattanooga Medical Department.
 University of Louisville Medical Department.
 University of Nashville Medical Department.
 North Carolina Medical College.
 Medical College of the State of South Carolina.
 University of the South Medical College.
 Southwestern Homeopathic Medical College and Hospital.
 University of Tennessee College of Medicine.
 Vanderbilt University Medical Department.

SOUTHERN:

University of Alabama School of Medicine.
 University of Arkansas Medical Department.
 Hospital Medical College, Eclectic, Atlanta.
 Baylor University College of Medicine.
 Emory University School of Medicine.
 Georgia College of Eclectic Medicine and Surgery.
 University of Georgia Medical Department.
 Mississippi Medical College.
 University of Oklahoma School of Medicine.
 Physio-Medical College of Texas.
 Southern Methodist University Medical Department.

Médical Department of the Texas Christian University.
University of Texas Department of Medicine.
Tulane University of Louisiana School of Medicine.

NORTH CENTRAL:

Cincinnati College of Medicine and Surgery.
Eclectic Medical College, Cincinnati.
University of Cincinnati College of Medicine.
Cleveland Homeopathic Medical College.
Detroit Homeopathic Medical College.
Detroit Medical College.
Grand Rapids Medical College.
Medical Department Hamline University.
Marquette University School of Medicine.
University of Michigan Medical School.
University of Michigan Homeopathic Medical School.
Milwaukee Medical College.
Minneapolis College of Physicians and Surgeons.
University of Minnesota Medical School.
University of Minnesota College of Homeopathic Medicine and Surgery.
Ohio State University, College of Medicine.
Saginaw Valley Medical College.
Toledo Medical College.
Western Reserve University School of Medicine.
Wisconsin College of Physicians and Surgeons.

CENTRAL:

Chicago College of Medicine and Surgery.
Dearborn Medical College.
Ensworth Medical College.
Hahnemann Medical College and Hospital of Chicago.
Hering Medical College.
University of Illinois College of Medicine.
Indiana Eclectic Medical College.
Indiana University School of Medicine.
Physio-Medical College of Indiana.
State University of Iowa College of Medicine.
State University of Iowa College of Homeopathic Medicine.
Jenner Medical College.
John A. Creighton Medical College.
University of Kansas School of Medicine.
University Medical College of Kansas City.
Eclectic Medical University, Kansas City.
Lincoln Medical College.
Chicago College of Medicine and Surgery, School of Medicine of Loyola University.
Homeopathic Medical College of Missouri.
National Medical University, Chicago.
National University of Arts and Sciences, St. Louis.
University of Nebraska College of Medicine.
Northwestern University Medical School.
Rush Medical College.
Sioux City College of Medicine.

Kansas City Hahnemann Medical College.
 St. Louis University School of Medicine.
 Washington University Medical School.

WESTERN:

University of California Medical School.
 Hahnemann Medical College of the Pacific.
 University of Southern California (College of Physicians and Surgeons).
 University of Southern California Medical College.
 California Eclectic Medical College.
 University of Colorado School of Medicine.
 Leland Stanford Junior University School of Medicine.
 University of Oregon Medical School.
 College of Physicians and Surgeons of San Francisco.

Distribution of alpha scores of men who were graduated from schools in each section is similar to that shown in table 17. This is naturally the case, as the groups of men from schools in different sections overlap to a large extent the group of doctors practicing in these sections so that many members of the group are identical. In other words, the majority of the doctors attended school in the same state in which they are practicing; they usually hold certificate from that state, or from the state in which their school is situated. It is interesting to find that on the whole the schools, good or poor, large or small, of a given section of country, did represent fairly well the intelligence level of the medical profession in that section.

Difference in the earning power of graduates from schools of these groups are again so closely similar to the difference shown in table 22 that they need not be again presented. The South central group of states is again the lowest in the median pay received by doctors graduated from schools within its borders. The differences are somewhat smaller than those of table 22 and are doubtless partially due to the fact that graduates of these schools are also largely practicing in these states.

Classification of the Medical Schools by Size

When graded according to size the schools represented fall into the classification which follows. (The figures were taken from the American Medical Directory for 1918, which gives the number of students registered in 1916-17.)

Grouping of Schools by Size

0-49 students

University of Alabama School of Medicine, Mobile.
 University of Arkansas Medical Department, Little Rock.

Dartmouth Medical School, Hanover, N. H.
State University of Iowa College of Homeopathic Medicine, Iowa City.
Lincoln Medical College, Eclectic, Lincoln, Nebraska.
Eclectic Medical University, Kansas City, Missouri.
University of Michigan Homeopathic Medical School, Ann Arbor.

50-99 students

Baylor University College of Medicine, Dallas, Texas.
Boston University School of Medicine, Boston, Mass.
Bowdoin Medical School, Medical Department of Bowdoin College, Brunswick and Portland, Maine.
Eclectic Medical College, Cincinnati, Ohio.
College of Physicians and Surgeons, Boston, Mass.
University of Colorado School of Medicine, Boulder and Denver.
Georgetown University School of Medicine, Washington, D. C.
University of Georgia Medical Department, Augusta.
Hahnemann Medical College and Hospital of Chicago, Ill.
University of Oklahoma School of Medicine, Norman and Oklahoma City.
College of Physicians and Surgeons of San Francisco, Calif.
Medical College of the State of South Carolina, Charleston.
Temple University Department of Medicine, Philadelphia, Pa.
Medical Department of the Texas Christian University, Fort Worth.
University of Vermont College of Medicine, Burlington.
Yale University School of Medicine, New Haven, Conn.

100-149 students

University of California Medical School, Berkeley and San Francisco.
University of Southern California College of Medicine, Los Angeles.
Hahnemann Medical College of the Pacific, San Francisco, California.
College of Physicians and Surgeons (Medical Department of the University of Southern California), Los Angeles.
Leland Stanford Junior University School of Medicine, Palo Alto and San Francisco, California.
University of Kansas School of Medicine, Lawrence and Rosedale.
Kansas Medical College, Topeka.
John A. Creighton Medical College, Medical Department of the Creighton University, Omaha, Nebraska.
Jenner Medical College, Chicago, Ill.
Hahnemann Medical College and Hospital of Philadelphia, Pa.
George Washington University Medical School (National University Medical Department), Washington, D. C.
University of Louisville Medical Department, Louisville, Ky. (Hospital College of Medicine, Medical Department, Central University of Kentucky; Kentucky School of Medicine; Kentucky University Medical Department; and Louisville Medical College).
University of Nebraska College of Medicine, Omaha, Neb.
University of Pittsburgh School of Medicine, Pittsburgh, Pa.
Syracuse University College of Medicine, Syracuse, N. Y.
Union University Medical Department (Albany Medical College), Albany, N. Y.
University of Virginia Department of Medicine, Charlottesville.
Washington University Medical School, St. Louis, Missouri.
St. Louis Medical College, St. Louis, Missouri.
Missouri Medical College, St. Louis, Missouri.

150-199 students

University of Buffalo Department of Medicine, Buffalo, N. Y.
Cornell University Medical College, Ithaca and New York City, N. Y.
Detroit College of Medicine and Surgery, Detroit, Mich.
Indiana University School of Medicine, Bloomington and Indianapolis.
Medico-Chirurgical College of Philadelphia, Pa.
New York Homeopathic Medical College and Flower Hospital, New York City.
Vanderbilt University Medical Department, Nashville, Tenn.

200-249 students

University of Illinois College of Medicine, Chicago.
Northwestern University Medical School, Chicago.

250-299 students

St. Louis University School of Medicine, St. Louis, Mo.
Fordham University School of Medicine, New York City.
Long Island College Hospital, Brooklyn, N. Y.
University of Minnesota Medical School, Minneapolis.
University of Texas Department of Medicine, Galveston.
Tulane University of Louisiana School of Medicine, New Orleans.

300-399 students

Medical School of Harvard University, Boston, Mass.
Johns Hopkins University Medical Department, Baltimore, Md.
University of Michigan Medical School, Ann Arbor.
Tufts College Medical School, Boston, Mass.

400 or more students

University and Bellevue Hospital Medical College, New York City.
Columbia University College of Physicians and Surgeons, New York City.
Jefferson Medical College of Philadelphia, Pa.
University of Pennsylvania School of Medicine, Philadelphia.
Rush Medical College, Chicago, Ill.

Unclassified

University of Cincinnati College of Medicine, Cincinnati, Ohio.
Emory University School of Medicine, Atlanta, Georgia.
Chicago College of Medicine and Surgery, School of Medicine of Loyola University, Chicago, Ill.
State University of Iowa, College of Medicine, Iowa City.
Marquette University School of Medicine, Milwaukee, Wis.
University of Maryland School of Medicine and the College of Physicians and Surgeons, Baltimore, Md.
Ohio State University College of Medicine, Columbus.
University of Oregon Medical School, Portland.
University of Tennessee College of Medicine, Memphis.
Medical College of Virginia, Richmond.
Western Reserve University School of Medicine, Cleveland, Ohio.

Extinct

Hospital Medical College, Eclectic, Atlanta, Georgia.

Atlantic Medical College, Baltimore, Md.
Baltimore University School of Medicine, Baltimore, Md
California Eclectic Medical College, Los Angeles, Calif.
Chattanooga Medical College, Chattanooga, Tenn.
Cincinnati College of Medicine and Surgery, Cincinnati, Ohio.
Cleveland Homeopathic Medical College, Cleveland, Ohio.
Dearborn Medical College, Chicago, Ill.
Detroit Homeopathic Medical College, Detroit, Mich.
Ensworth Medical College, St. Joseph, Mo.
Georgia College of Eclectic Medicine and Surgery, Atlanta.
Grand Rapids Medical College, Grand Rapids, Mich.
Hering Medical College, Chicago, Ill.
Indiana Eclectic Medical College, Indianapolis.
Physio-Medical College of Indiana, Indianapolis.
University Medical College of Kansas City, Mo.
Maryland Medical College, Baltimore.
Milwaukee Medical College, Milwaukee, Wis.
University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis.
Homeopathic Medical College of Missouri, St. Louis.
Mississippi Medical College, Meridian.
University of Nashville Medical Department, Nashville, Tenn.
National Medical University, Chicago, Ill.
National University of Arts and Sciences, Medical Department, St. Louis, Mo.
Eclectic Medical College of the City of New York.
Saginaw Valley Medical College, Saginaw, Mich.
Sioux City College of Medicine, Sioux City, Iowa.
University of the South Medical College (Sewanee Medical College), Sewanee, Tenn.
Southern Methodist University Medical Department, Dallas, Texas.
Kansas City Hahnemann Medical College, Kansas City, Mo.
Southwestern Homeopathic Medical College and Hospital, Louisville, Ky.
Toledo Medical College (Medical Department Toledo University), Toledo, Ohio.
Wisconsin College of Physicians and Surgeons, Milwaukee, Wis.

The first question is whether the men graduated from the larger institutions are a more intelligent group than those from the smaller schools. Table 35 shows that on the whole they are. Differences are not very large, and the variations are rather irregular. The lowest group of schools with less than 50 students is represented by only 59 individuals, too few for reliability. In figure 7 the three lowest groups, including all those from schools with less than 150 students, are compared with the groups from schools with 300 or more students each. This large-attendance group, including nine different schools, stands out as distinctly above the others in intelligence.

The earnings reported by graduates from schools of different size fall in a manner which is irregular and almost impossible to interpret. It seems obvious that other factors than the size of the

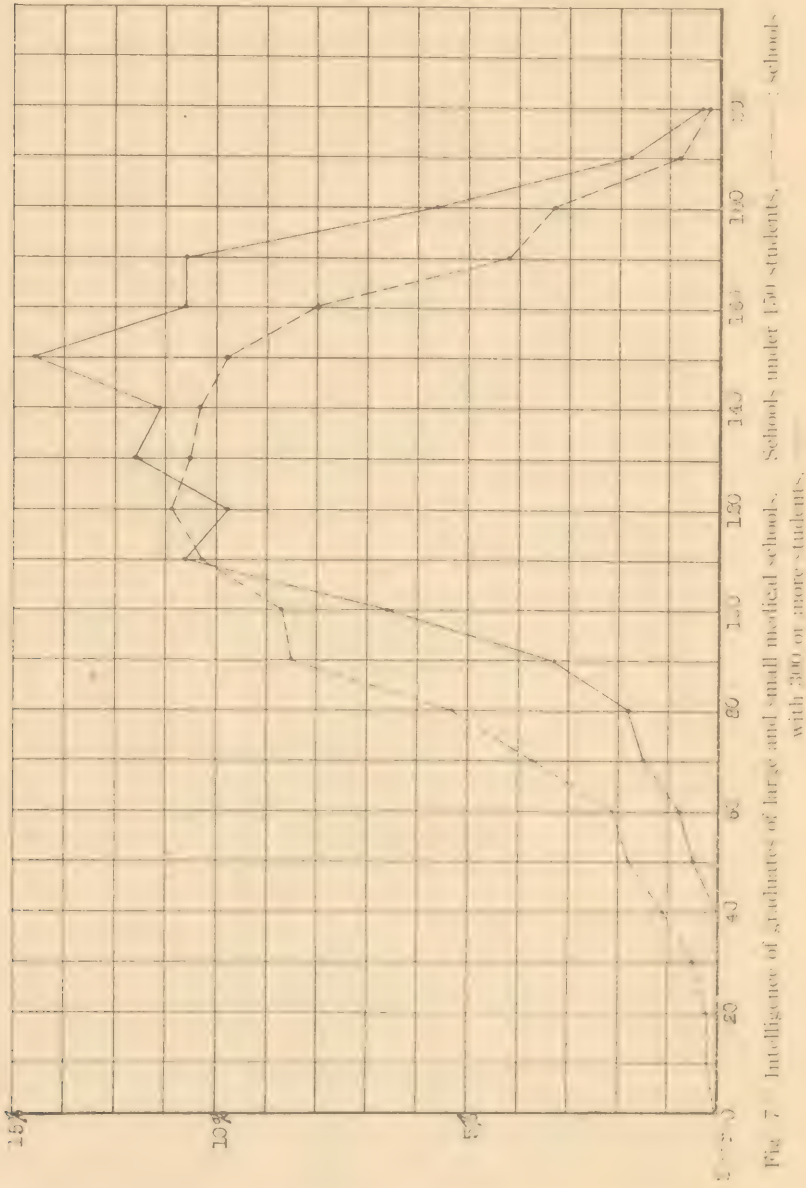


Fig. 7 Intelligence of graduates of large and small medical schools, with 300 or more students, schools with 150 students, schools with 20 or more students.

TABLE 35

Distribution of alpha scores of graduates from schools
of different size

Alpha score	Number of students								Ex- tinct schools	Unclas- sified schools	Total
	0 to 49	50 to 99	100 to 149	150 to 199	200 to 249	250 to 299	300 to 399	400 or more			
200-204	1	..	..	..	..	..	1	1	..	..	3
190-199	1	1	3	1	..	2	3	8	1	2	22
180-189	1	8	10	4	5	3	13	21	2	10	77
170-179	3	11	12	9	7	7	22	42	4	14	131
160-169	6	16	28	11	19	15	25	39	13	23	195
150-159	5	16	40	22	16	15	19	63	13	41	250
140-149	4	19	41	23	34	17	27	40	20	41	266
130-139	4	21	40	22	23	27	25	45	21	61	289
120-129	9	14	45	27	26	16	19	40	19	61	276
110-119	6	20	38	30	17	23	17	47	22	64	284
100-109	4	9	41	22	17	17	14	26	16	60	226
90- 99	6	18	29	17	4	13	1	19	13	52	172
80- 89	5	6	22	15	6	9	3	8	16	31	121
70- 79	2	6	15	8	2	9	2	7	8	17	76
60- 69	..	3	10	3	3	1	1	4	8	20	53
50- 59	1	2	8	2	1	2	..	3	4	14	37
40- 49	1	..	6	1	..	1	..	..	2	8	19
30- 39	..	..	3	1	..	1	..	..	..	2	7
20- 29	..	..	1	..	..	..	..	..	1	..	2
10- 19	..	..	1	..	..	..	..	..	..	..	1
Total...	59	170	393	218	180	178	192	413	183	521	2507
Median	126.3	133.5	124.7	123.6	135.9	127	145.4	142.2	120.5	119.1	129.2

College of Medicine and Northwestern University Medical School, both in Chicago. The experience of the different groups is uneven and interferes with direct comparison. Table 36 indicates the distribution of earnings and median experience in the groups of schools of different size.

Classification of the Medical Schools by Entrance Requirements

As it was impracticable to ascertain the entrance requirement of each school for every year in which a member of the group of medical officers entered it, classification has been made on the basis of the entrance requirement guaranteed as enforced in the year 1916-1917. This information was contained in a personally certified letter to the Surgeon General of the Army from a responsible school official of each college. It is obvious that this method of

TABLE 36
Distribution of earnings of graduates from schools
of different size

Annual earnings	Number of students								Extinct schools	Unclassified schools	Total
	0 to 49	50 to 99	100 to 149	150 to 199	200 to 249	250 to 299	300 to 399	400 and above			
\$30,000 and over	..	..	2	..	..	1	1	3	..	1	8
25,000	..	..	..	..	1	..	..	1	..	1	4
20,000	..	..	..	..	..	1	2	3	1	3	9
18,000	..	..	1	..	..	..	2	3	..	1	7
16,000	..	1	..	1	..	..	1	1	1	..	5
14,000	..	2	1	3	3	..	2	10	..	2	23
12,000	1	1	4	2	7	3	1	8	4	4	35
10,000	2	3	14	4	5	6	8	18	4	11	75
9,000	..	1	3	3	5	2	2	7	2	5	30
8,000	1	3	5	7	5	9	6	11	5	12	64
7,000	2	2	13	6	6	2	2	14	2	10	59
6,000	2	13	18	14	11	15	13	20	13	23	142
5,000	4	18	25	12	15	11	11	25	15	34	170
4,000	8	15	37	17	9	13	11	28	14	49	201
3,000	13	17	51	24	21	19	19	36	26	71	297
2,500	2	11	16	15	3	6	10	15	12	29	119
2,000	2	12	38	9	6	12	8	17	13	38	155
1,500	1	7	11	4	3	11	2	7	6	14	66
1,000	1	3	10	4	..	3	7	8	1	12	49
500-999	1	..	5	3	1	1	1	2	..	4	18
Earnings not known	19	61	139	90	79	63	83	176	64	197	971
Total...	59	170	393	218	180	178	192	413	183	521	2507
Median	\$4000	\$4233	\$3922	\$4294	\$5500	\$4423	\$4682	\$5240	\$4107	\$3915	\$4318
Median score	126.3	133.5	124.7	123.6	135.9	127	145.4	142.2	120.5	119.1	129.2
Median years' experience	8.8	11.01	12.97	10.81	9.08	9.65	9.4	12.13	13.48	10.18	11.07

classification is unsatisfactory since many of the poorer schools have ceased to exist or have increased their entrance requirements, whereas better schools have made less radical changes.

The lowest requirement reported is one year of college work in addition to high school graduation and certain science requirements.

The highest requirement (the Johns Hopkins Medical School only) is graduation from college.

Grouping of Schools by Entrance Requirements

One year of college work

University of Arkansas Medical Department.
Baylor University College of Medicine.
University and Bellevue Hospital Medical College.
Eclectic Medical College, Cincinnati.
Detroit College of Medicine and Surgery.
Emory University School of Medicine.
Fordham University School of Medicine.
George Washington University Medical School.
University of Georgia Medical Department.
Hahnemann Medical College and Hospital of Philadelphia.
John A. Creighton Medical College.
University of Louisville Medical Department.
Chicago College of Medicine and Surgery, School of Medicine of Loyola University.
Long Island College Hospital.
University of Maryland School of Medicine and the College of Physicians and Surgeons.
New York Homeopathic Medical College and Flower Hospital.
University of Oregon Medical School, and Willamette University Medical Department.
St. Louis University School of Medicine.
Temple University Department of Medicine.
University of Tennessee College of Medicine.
Medical Department of the Texas Christian University.
Tulane University of Louisiana School of Medicine.
Union University (Albany Medical College).
Vanderbilt University Medical Department.
University of Buffalo Department of Medicine.

Two years of college work

University of Alabama School of Medicine.
Boston University School of Medicine.
Bowdoin Medical School.
University of California Medical School.
Medical Department of the University of Southern California.
University of Cincinnati College of Medicine.
University of Colorado School of Medicine.
Columbia University College of Physicians and Surgeons.
Dartmouth Medical School.
Georgetown University School of Medicine.
Hahnemann Medical College and Hospital of Chicago.
University of Illinois College of Medicine.
Indiana University School of Medicine.
State University of Iowa College of Medicine.
State University of Iowa College of Homeopathic Medicine.
University of Kansas School of Medicine.
Jefferson Medical College of Philadelphia.
Marquette University School of Medicine.

University of Michigan Medical School.
 University of Michigan Homeopathic Medical School.
 University of Minnesota Medical School, and Medical Department Hamline University.
 University of Nebraska College of Medicine.
 Northwestern University Medical School.
 University of Oklahoma School of Medicine.
 University of Pittsburgh School of Medicine.
 University of Pennsylvania School of Medicine.
 Rush Medical College.
 Syracuse University College of Medicine.
 Medical College of the State of South Carolina.
 University of Texas Department of Medicine.
 University of Virginia Department of Medicine.
 Medical College of Virginia.
 Yale University School of Medicine.
 Washington University Medical School.

Three years of college work

Cornell University Medical College.
 Leland Stanford Junior University School of Medicine.
 Western Reserve University School of Medicine.

More than three years of college work

Johns Hopkins University Medical Department.
 Medical School of Harvard University.

Unclassified

College of Physicians and Surgeons, Boston.
 Jenner Medical College.
 Eclectic Medical University, Kansas City.
 Lincoln Medical College.
 Minneapolis College of Physicians and Surgeons.
 Ohio State University College of Medicine and Ohio Medical University.
 Medico-Chirurgical College of Philadelphia.
 College of Physicians and Surgeons of San Francisco.
 Tufts College Medical School.
 University of Vermont College of Medicine.

Extinct

As listed on pages 514, 515.

Distributions of median alpha scores of these groups of schools with different entrance requirements are shown in table 37. The decided differences between the medians show that the entrance requirement is an important factor in determining the intelligence of the students graduated. The higher the requirements the more intelligent the group. The difference between the lowest group and the highest (medians 118.7 and 154.2) is as great as that between the geographical section showing the lowest intelligence and that showing the highest. No other classification exhibits as great differences in alpha scores as this.

TABLE 37

Distribution of alpha scores of graduates from schools
with different entrance requirements

Alpha score	One year college	Two years college	Three years college	Further requirements	Extinct	Unclassified	Total
200-204	...	2	...	1	...	...	3
190-199	3	14	1	3	1	...	22
180-189	13	40	5	12	2	5	77
170-179	20	78	6	15	4	8	131
160-169	48	102	6	16	13	10	195
150-159	70	133	6	14	13	14	250
140-149	63	144	3	16	20	20	266
130-139	87	133	8	15	21	25	289
120-129	97	126	5	6	19	23	276
110-119	115	111	5	9	22	22	284
100-109	96	91	4	5	16	14	226
90- 99	76	71	...	...	13	12	172
80- 89	47	42	...	...	16	16	121
70- 79	44	20	...	...	8	4	76
60- 69	23	18	...	...	8	4	53
50- 59	18	11	1	...	4	3	37
40- 49	11	5	1	...	2	...	19
30- 39	7	...	...	...	...	...	7
20- 29	...	1	...	...	1	...	2
15- 19	1	...	...	...	...	...	1
Total.....	839	1142	51	112	183	180	2507
Median....	118.7	135.9	146.3	154.2	120.5	126.4	129.2

The earnings of graduates from schools in these groups (table 38) show the same tendency to increase with the increase of entrance requirements, except that the highest group, including the Johns Hopkins Medical School and Harvard Medical School, report on the whole lower earnings than the preceding group. The differences given are striking and show clearly that the graduates from medical schools with high entrance requirements earn more than the graduates of other schools. This may be because the schools which have the more advanced educational basis on which to build lead their students to greater specialization, and that as specialists they have a higher earning capacity. That difference in length of previous experience is not mainly responsible for these differences in earnings is indicated by the medians for experience at the bottom of the table.

TABLE 38

Distribution of earnings of graduates from schools with
different entrance requirements

Annual salary	One year college	Two years college	More than two years college	Extinct	Unclassified	Total
\$30,000	3	9	..	..	..	12
18,000	2	11	2	1	..	16
16,000	5	18	2	1	1	27
12,000	9	20	1	4	2	36
10,000	18	41	8	4	4	75
8,000	29	44	7	7	7	94
6,000	59	95	20	13	10	201
4,000	120	173	18	29	31	371
3,000	110	123	17	25	21	297
2,500	50	39	4	12	14	119
2,000	74	54	6	13	8	155
1,500	29	26	2	6	3	66
1,000	18	19	6	1	5	49
500-999	9	8	1	..	..	18
Salary not known	304	462	69	64	72	971
Total.....	839	1142	163	183	180	2507
Median...	\$3795	\$4807	\$5300	\$4107	\$4150	...
Median score....	118.7	135.9	150.9	120.5	126.4	129.2
Median years' experience...	10.47	11.50	9.39	13.48	9.53	11.07

Classification According to Rating of American Medical Association

The general excellence of the school or the extent to which it attained the standard of the American Medical Association, as indicated by the rating given by the Association, served as a basis for the following classification. The American Medical Directory of 1918 was used as source of information.

Grouping of Schools by Rating of American Medical Association

Class A

- University of Alabama School of Medicine.
- Baylor University College of Medicine.
- University and Bellevue Hospital Medical College.
- Boston University School of Medicine.

Bowdoin Medical School.
University of Buffalo Department of Medicine.
University of California Medical School, and Hahnemann Medical College of the Pacific.
University of Cincinnati College of Medicine.
University of Colorado School of Medicine.
Columbia University College of Physicians and Surgeons.
Cornell University Medical College.
Dartmouth Medical School.
Detroit College of Medicine and Surgery.
Emory University School of Medicine.
Fordham University School of Medicine.
Georgetown University School of Medicine.
George Washington University Medical School.
University of Georgia Medical Department.
Hahnemann Medical College and Hospital of Philadelphia.
Medical Department Hamline University.
Medical School of Harvard University.
University of Illinois College of Medicine.
Indiana University School of Medicine.
State University of Iowa College of Medicine.
State University of Iowa College of Homeopathic Medicine.
Jefferson Medical College of Philadelphia.
John A. Creighton Medical College.
Johns Hopkins University Medical Department.
University of Kansas School of Medicine, and Kansas Medical College.
Leland Stanford Junior University School of Medicine.
Long Island College Hospital.
University of Louisville Medical Department.
Marquette University School of Medicine.
University of Maryland School of Medicine and the College of Physicians and Surgeons.
University of Michigan Medical School.
University of Michigan Homeopathic Medical School.
University of Minnesota Medical School.
University of Nebraska College of Medicine.
Northwestern University Medical School.
Ohio State University College of Medicine.
Minneapolis College of Physicians and Surgeons.
University of Oregon Medical School, and Willamette University Medical Department.
University of Pennsylvania School of Medicine.
University of Pittsburgh School of Medicine.
Rush Medical College.
Medical College of the State of South Carolina.
St. Louis University School of Medicine.
Syracuse University College of Medicine.
Medico-Chirurgical College of Philadelphia.
University of Tennessee College of Medicine.
University of Texas Department of Medicine.
Tufts College Medical School.
Tulane University of Louisiana School of Medicine.

Albany Medical College.
 Vanderbilt University Medical Department.
 University of Vermont College of Medicine.
 University of Virginia Department of Medicine.
 Medical College of Virginia.
 Washington University Medical School.
 Western Reserve University School of Medicine.
 Yale University School of Medicine.

Class B

Chicago College of Medicine and Surgery.
 University of Arkansas Medical Department.
 University of Southern California Medical Department, and University of Southern California College of Medicine.
 Eclectic Medical College, Cincinnati.
 Hahnemann Medical College and Hospital of Chicago.
 Chicago Homeopathic Medical College.
 Chicago College of Medicine and Surgery, School of Medicine of Loyola University.
 New York Homeopathic Medical College and Flower Hospital.
 University of Oklahoma School of Medicine.
 Temple University Department of Medicine.
 Medical Department of the Texas Christian University.

Class C

College of Physicians and Surgeons, Boston.
 Jenner Medical College.
 Eclectic Medical University, Kansas City.
 Lincoln Medical College.
 College of Physicians and Surgeons of San Francisco.

Extinct

As listed on pages 514, 515.

Table 39 shows the results with respect to scores on intelligence examination alpha. Here again there are obvious differences between the intelligence levels of the groups. The difference between the median alpha scores of the groups from schools rated C and from those rated A is little more than half as great as between schools requiring one year of college work and those requiring college graduation for entrance, but it is, nevertheless, significant. It is interesting that the schools rated C stand as a group even below those schools in each list which have already become extinct. The extinct group is well below the whole group in intelligence, and also in earnings, although naturally the median experience is greater.

The earnings of graduates from schools rated B and C are reported as somewhat lower (table 40) than earnings of those from schools rated A and the differences in experience shown at the foot of table 40 are not such as entirely to account for this. It should

TABLE 39

Distribution of alpha scores of graduates from schools differently rated by the American Medical Association

Alpha score	A. M. A. rating			Extinct	Total
	Class A	Class B	Class C		
200-204	3	..	..	..	3
190-199	20	1	..	1	22
180-189	69	5	1	2	77
170-179	124	3	..	4	131
160-169	171	10	1	13	195
150-159	221	16	..	13	250
140-149	234	11	1	20	266
130-139	249	17	2	21	289
120-129	233	22	2	19	276
110-119	238	20	4	22	284
100-109	199	8	3	16	226
90-99	133	24	2	13	172
80-89	99	4	2	16	121
70-79	60	8	..	8	76
60-69	43	2	..	8	53
50-59	33	..	..	4	37
40-49	16	1	..	2	19
30-39	6	1	..	..	7
20-29	..	1	..	1	2
10-19	1	..	..	..	1
Total.....	2152	154	18	183	2507
Median....	130.6	123.3	113.3	120.5	129.2

be noted, however, that the experience of medical officers from schools in group B is less than that of those from schools in the other groups.

Classification by Medical Sect

Comparisons between schools belonging to different medical sects were started by means of information given in the American Medical Directory for 1918. The institutions calling themselves "regular," "homeopathic" and "eclectic" were as follows:

Grouping of Schools by Medical Sect

Regular

University of Alabama School of Medicine.
 University of Arkansas Medical Department.
 Baltimore University School of Medicine.
 Baylor University College of Medicine.
 University and Bellevue Hospital Medical College.

College of Physicians and Surgeons, Boston.
 Bowdoin Medical School.
 University of Buffalo Department of Medicine.
 University of California Medical School.
 University of Southern California College of Medicine.
 Chattanooga Medical College.
 Cincinnati College of Medicine and Surgery.
 University of Cincinnati College of Medicine.
 University of Colorado School of Medicine.
 Columbia University College of Physicians and Surgeons.
 Cornell University Medical College.
 Dartmouth Medical School.

TABLE 40

Distribution of earnings of graduates from schools differently rated by the American Medical Association

Earnings	A. M. A. rating			Extinct	Total
	Class A	Class B	Class C		
\$30,000 and over	8	..	..	..	8
25,000	4	..	..	..	4
20,000	8	..	..	1	9
18,000	7	..	..	..	7
16,000	4	..	..	1	5
14,000	21	1	..	..	22
12,000	31	1	..	4	36
10,000	68	3	..	4	75
9,000	27	1	..	2	30
8,000	56	2	1	5	64
7,000	56	1	..	2	59
6,000	116	11	2	13	142
5,000	149	6	..	15	170
4,000	175	10	2	14	201
3,000	238	29	4	26	297
2,500	100	5	2	12	119
2,000	131	11	..	13	155
1,500	55	5	..	6	66
1,000	44	3	1	1	49
500-999	17	1	..	..	18
Earnings not known.....	847	64	6	64	971
Total.....	2152	154	18	183	2507
Median.....	\$4385	\$3690	\$3750	\$4107	\$4318
Median score....	130.6	123.3	113.3	120.5	129.2
Median years' experience.....	11.06	7.39	10.71	13.48	11.07

Dearborn Medical College.
Detroit College of Medicine and Surgery.
Emory University School of Medicine.
Ensworth Medical College.
Fordham University School of Medicine.
Georgetown University School of Medicine.
George Washington University Medical School.
University of Georgia Medical Department.
Grand Rapids Medical College.
Medical Department Hamline University.
Medical School of Harvard University.
University of Illinois College of Medicine.
Indiana University School of Medicine, and Physio-Medical College of Indiana.
State University of Iowa College of Medicine.
Jefferson Medical College of Philadelphia.
Jenner Medical College.
John A. Creighton Medical College.
Johns Hopkins University Medical Department.
University of Kansas School of Medicine, and Kansas Medical College.
University Medical College of Kansas City.
Iceland Stanford Junior University School of Medicine.
Long Island College Hospital.
University of Louisville Medical Department.
Marquette University School of Medicine.
University of Maryland School of Medicine, and the College of Physicians and Surgeons.
Milwaukee Medical College.
University of Michigan Medical School.
University of Minnesota Medical School.
Mississippi Medical College.
University of Nashville Medical Department.
Maryland Medical College.
National University of Arts and Sciences Medical Department.
University of Nebraska College of Medicine.
Northwestern University Medical School.
Ohio State University College of Medicine.
University of Oklahoma School of Medicine.
University of Oregon Medical School, and Willamette University Medical Department.
University of Pennsylvania School of Medicine.
Medico-Chirurgical College of Philadelphia.
University of Pittsburgh School of Medicine.
Rush Medical College.
Saginaw Valley Medical College.
College of Physicians and Surgeons of San Francisco.
Sioux City College of Medicine.
Medical College of the State of South Carolina.
University of the South Medical College.
Southern Methodist University Medical Department.
St. Louis University School of Medicine.
Temple University Department of Medicine.
University of Tennessee College of Medicine.

Medical Department of the Texas Christian University.
 University of Texas Department of Medicine.
 Toledo Medical College.
 Tufts College Medical School.
 Tulane University of Louisiana School of Medicine.
 Albany Medical College.
 Vanderbilt University Medical Department.
 University of Vermont College of Medicine.
 University of Virginia Department of Medicine.
 Washington University Medical School.
 Western Reserve University School of Medicine.
 Wisconsin College of Physicians and Surgeons.
 Yale University School of Medicine.

Homeopathic

Atlantic Medical College.
 Boston University School of Medicine.
 Hahnemann Medical College of the Pacific.
 Cleveland Homeopathic Medical College.
 Detroit Homeopathic Medical College.
 Hahnemann Medical College and Hospital of Chicago.
 Chicago Homeopathic Medical College.
 Hahnemann Medical College and Hospital of Philadelphia.
 Hering Medical College.
 State University of Iowa College of Homeopathic Medicine.
 University of Michigan Homeopathic Medical School.
 University of Minnesota College of Homeopathic Medicine and Surgery.
 Missouri Medical College.
 National Medical University.
 New York Homeopathic Medical College and Flower Hospital.
 Kansas City Hahnemann Medical College.
 Southwestern Homeopathic Medical College and Hospital.

Eclectic

Hospital Medical College, Eclectic, Atlanta.
 California Eclectic Medical College.
 Chicago College of Medicine and Surgery.
 Eclectic Medical College, Cincinnati.
 Georgia College of Eclectic Medicine and Surgery.
 Indiana Eclectic Medical College.
 Eclectic Medical University, Kansas City.
 Lincoln Medical College, Eclectic.
 Chicago College of Medicine and Surgery, School of Medicine of Loyola University.
 Eclectic Medical College of the City of New York.
 Syracuse University College of Medicine.

Graduates from homeopathic medical schools made scores on examination alpha as much greater than those made by graduates from schools calling themselves eclectic as are the scores of Class A schools above those of Class C (table 41). The median alpha scores of graduates from "regular" schools fall approximately half way between those of groups from homeopathic and eclectic

schools. It is of course possible that homeopathic physicians were scrutinized with special care before they were commissioned in the army so that they were thus more carefully selected than the "regulars." The homeopathic group shows the same superiority in the matter of earnings, though this may be partly accounted for by its greater experience. The eclectic group reports lower earnings than the regulars, but this may be accounted for by its relative lack of experience (table 42).

TABLE 41

Distribution of alpha scores of graduates from schools of different medical sects

Alpha score	Regular	Homeopathic	Eclectic	Total
200-204	3	..	..	3
190-199	19	2	1	22
180-189	71	4	2	77
170-179	126	5	..	131
160-169	180	11	4	195
150-159	223	19	8	250
140-149	243	17	6	266
130-139	265	12	12	289
120-129	244	13	19	276
110-119	257	10	17	284
100-109	214	5	7	226
90- 99	148	8	16	172
80- 89	115	2	4	121
70- 79	68	..	8	76
60- 69	47	3	3	53
50- 59	37	..	..	37
40- 49	17	1	1	19
30- 39	6	..	1	7
20- 29	2	..	..	2
15- 19	1	..	..	1
Total.....	2286	112	109	2507
Median.....	128.5	140.8	117.8	129.2

Comparison of Schools

Eight schools are represented by more than 75 graduates each. These groups are considered large enough to yield fairly reliable statistical information. Ten additional schools are represented by from 35 to 60 graduates. The information for these schools, although less reliable, is worthy of presentation. Table 43 gives, for each of these 18 schools, the number of graduates by which

TABLE 42

Distribution of earnings of graduates from schools of different medical sects

Earnings	Regular	Homeopathic	Eclectic	Total
\$30,000 and over	8	..	..	8
25,000	4	..	..	4
20,000	9	..	..	9
18,000	7	..	..	7
16,000	5	..	..	5
14,000	20	1	1	22
12,000	32	3	1	36
10,000	69	5	1	75
9,000	28	1	1	30
8,000	60	2	2	64
7,000	54	4	1	59
6,000	123	12	7	142
5,000	158	7	5	170
4,000	187	6	8	201
3,000	258	20	19	297
2,500	109	6	4	119
2,000	144	5	6	155
1,500	62	2	2	66
1,000	43	1	5	49
500-999	17	..	1	18
Earnings not known	889	37	45	971
Total	2286	112	109	2507
Median	\$4350	\$4583	\$3750	\$4318
Median score	128.5	140.8	117.8	129.2
Median yrs. experience	10.11	13.79	7	11.07

a school was represented, median alpha score, pre-medical education, total education, experience, annual earnings, percentage of the graduates who were members of the American Medical Association, percentage known to have been promoted while in the army and information concerning the specialties of graduates.

It is not surprising to find that a few schools are seemingly of outstanding excellence. There are, for example, among these 18 medical schools 5 which rank exceptionally high in intelligence of graduates. These 5 constitute two groups, the first of which comprises the Johns Hopkins Medical School and the Medical School of Harvard University, and the second, somewhat lower in intelligence of graduates, the College of Physicians and Surgeons

TABLE 43
Comparison of schools

Graduates from:	Number students 1917	Entrance require- ments 1917	Number cases	Median alpha score	Median pre-medical education	Median total educ.	Median experience	Median earnings	Percentage A. M. A. members	Percentage pro- moted in army	Percentage general practice	Percentage eye, ear, nose and throat	Percentage internal medicine	Percentage surgery
Columbia University College of Physicians and Sur- geons	491	2 yrs. Col.	79	148.8	15.13	18.42	12.03	\$5500	43.8	21.3	17.0	8.6	14.3	38.6
Medical School of Harvard University	357	Graduation ¹	77	153.1	15.32	18.86	11.25	5000	41.6	19.5	16.9	12.7	11.3	29.6
University of Illinois College of Medicine	213	2 yrs. Col.	88	129.4	11.83	15.83	9.1	4750	50.0	18.2	34.7	10.7	5.3	37.7
Jefferson Medical College of Philadelphia	540	2 yrs. Col.	81	129.2	12.59	16.5	9.83	4722	46.9	33.3	28.1	17.2	10.9	32.8
University of Maryland School of Medicine and the College of Physicians and Surgeons	298	1 yr. Col. ²	102	116.7	11.83	15.73	12.05	4944	38.2	24.5	35.6	21.1	7.8	18.9
Northwestern University Medical School	247	2 yrs. Col.	92	139.3	13.24	17.08	9.07	5889	53.3	19.6	25.3	13.3	3.6	49.4
University of Pennsylvania School of Medicine	585	2 yrs. Col.	81	148.8	13.8	18.09	12.67	5300	54.3	33.3	20.0	13.8	9.2	26.2
Rush Medical College	567	2 yrs. Col.	118	148.8	15.09	17.58	12.21	5500	50.8	25.4	26.1	8.7	14.1	37.0
ALL COLLEGES .....	—	.....	2507	129.2	12.16	16.07	11.07	4318	50.7	22.3	33.3	9.0	8.0	30.0
University and Bellevue Hospital Medical College	429	1 yr. Col. ²	54	126.7	11.88	15.86	15.5	5000	29.6	20.4	20.4	4.1	14.3	40.8
University of Buffalo Department of Medicine	196	1 yr. Col. ²	39	122.5	11.76	15.63	8.88	3000	38.5	7.7	20.6	17.6	8.8	26.5
Johns Hopkins University Medical Department	359	Graduation	35	155.8	15.56	19.44	7.67	5250	42.9	37.1	22.2	18.5	25.9	11.1
University of Louisville Medical Department	118	1 yr. Col. ²	60	113.1	11.70	15.68	8.5	3250	40.0	21.7	45.2	5.8	0	26.9
Chicago College of Medicine and Surgery, School of Medicine of Loyola University	643	1 yr. Col.	60	117.0	11.69	15.68	4.14	3318	16.0	.....	30.2	3.8	3.8	26.4
University of Michigan Medical School	322	2 yrs. Col.	47	136.3	13.17	16.86	12.69	4833	48.9	25.5	53.1	0.16	7.1	131.0
St. Louis University School of Medicine	254	1 yr. Col. ²	50	122.5	11.96	15.94	11.36	5000	52.0	24.0	31.1	22.2	6.7	25.7
University of Tennessee College of Medicine	122	1 yr. Col.	62	93.3	12.15	15.96	11.23	3250	30.6	14.5	54.7	9.4	3.8	22.6
Tulane University of Louisiana School of Medicine	267	1 yr. Col.	51	117.5	12.0	16.67	9.00	3875	37.3	21.6	33.3	15.5	2.2	35.6
Vanderbilt University Medical Department	152	1 yr. Col.	41	124.6	12.8	16.5	6.04	3667	46.3	31.7	734.5	6.9	13.8	37.9

¹ Harvard requires a bachelor's degree, or standing in upper third of class during two or three college years.² 2 yrs. college beginning 1918.

of Columbia University, the School of Medicine of the University of Pennsylvania and Rush Medical College.

The graduates of the medical schools of Johns Hopkins University and Harvard University present the highest scores on examination alpha and few exceptionally low scores, 100 points being practically the minimum. They also spend relatively more time on their medical training and command large earnings. In the latter respect, however, they are surpassed by the graduates of Northwestern University Medical School, the College of Physicians and Surgeons of Columbia University and Rush Medical College.

The earnings reported by the group from Northwestern University Medical School are notably high. This is not due to greater experience, for the median (9 years) for the group is two years less than that for the entire group of medical officers. It is not to be explained geographically, for in general schools in the same section show smaller earnings. Probably the unusually large proportion of surgeons is largely responsible for the high rank of the school in earnings of its graduates. It is interesting to compare the three Chicago schools from which there is a considerable number of cases: The University of Illinois College of Medicine, Northwestern University Medical School and Rush Medical College. The alpha medians are 129.4, 139.3, and 148.8, respectively. The median number of years devoted to education is 15.8, 17, 17.6, respectively; the median experience is 9.1, 9.1 and 12.2 years, and the median earnings, \$4750, \$5889 and \$5500.

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